The Flesh of Social Computing

Close, closer, closest. The final chapter in this book is on wearables. The closing chapter. The trajectory of convergence between bodies and technologies gaining momentum over the course of this book reaches a pinnacle in this chapter on wearable computing--miniaturized, embedded, wireless computers worn on, and warmed by, the body, enhancing abilities to transport, store, communicate, and modify personal data. Anyone with a knowledge of experimental digital arts practices might ask why this point of convergence between bodies and technologies is not also the point of a scalpel, why this chapter is not a consideration of biotech, piercing or penetrating the skin in order to achieve a bloody proximity between bodies and technologies. This could be the next stage in the journey of closeness, but the conviction that technologies come closest to bodies through biotech or surgery is based on maintaining a divide between inner and outer, on the assumptions that skin still acts as a barrier and that flesh or tissue needs to be physically opened up in order for there to be an ultimate convergence or confrontation between flesh and technologies.1

The phenomenological exchanges across performance, responsive systems, and ideas from Merleau-Ponty, Levinas, and Deleuze developed in the previous chapters call for a more subtle approach to closeness, not one based on subsumption, on the swallowing of one by the other. If the Merleau-Pontian notion of flesh is taken seriously, there is no need to pierce, cut, ingest, or extract in order to achieve a state of closeness or integration: we are already inside out, already porous, already one flesh that is not one flesh. "Where are we to put the limit between the body and the world since the world is flesh?" (Merleau-Ponty 1968, 138). In this chapter, the play between the internality of affective states and the externality of social choreographies facilitated by mobile wireless devices will build upon the approach to ethics introduced in the preceding discussion of alterity and motion capture, according to which ethics is seen to be a topology of immanent modes of existence rather than transcendent values (Deleuze 1988, 23). If wearables enable a dissemination of immanence, how are our corporealities and our socialities transformed?

There is an extraordinary push-pull to wearable and ambient technologies, a dynamic of seduction and repulsion. We are seduced by the convergence of computational systems with corporeality (wearable technologies) or by unseen systems that anticipate corporeal needs (ubiquitous computing); seduced by the potential expansion of our senses, intellects, and imaginations, of how we engage with the world, how we communicate, how we remember the past and project desires into the future. Yet we are only a breath away from repulsion at the specter of the monstrous body or monstrous forces of surveillance and control lurking just behind the technologization of the body. Once the domain of research and performance converges with skin, blood, flesh, internal organs, biology, or DNA, political questions around who controls, owns, or has access to our bodies are unavoidable.2

In this chapter, the phenomenological ground for reflecting upon affective performance and social choreographies is provided by experiences around the design and implementation of the whisper[s] research project in wearable computing.3 This initiative, along with the increasing array of wearables projects that engineer innovative convergences between biometrics, fashion, performance, and design of smart wireless devices, finds itself within a contentious political domain: that of biometric tagging, public and private surveillance, and the acquisition, storage, and interpretation of personal data by governments and corporations, all in the interests of that ethical and political black hole called national security. Before too long, citizens of most countries are likely to have personal biometric data (DNA, blood type, fingerprints, retinal scans, details of diseases or medical conditions, history of medication) embedded in identity cards and passports, prompting questions around why we need a plastic card in our wallets if the data can be embedded in our bodies on silicon chips or RFID (radio frequency identification) tags such as those used to track dogs, and, increasingly, children. Digital art that deals closely with the body, and bio art that enters the body, offer the grounds to reframe classic tensions between the beautiful and the sublime: the sublime is no longer simply the monstrous body or the awesome spectacle, but relates to external control of our transformed corporealities.4 The convergence of digital information with corporeality has a sinister side, yet, like Amin and Thrift's "politics of hope" emerging from the new approach to urban life as "performative improvisations which are unforeseen and unforeseeable," the message of this book is not apocalyptic (2002, 4). Instead of running from the technologies used to control us, ingenious members of the public (artists, aficionados, teenagers, hackers, gardeners) have histories of using, adapting, and subverting products and systems. The design of wearable devices, and their intimate performance, are situated in this field of creative social improvisation.

The methodology sustaining this chapter is more akin to heterophenomenology than phenomenology: I witness, receive, and interpret the experiences of others in the whisper[s] garments embedded with wearable computers and filter these through my own experiences of collaborating on the design of the garments and of performing the role of guide in the installation.5 Quite deliberately, this methodology reflects the innately social qualities of wearables, or at least the multiplicity they evoke: multiple narratives, multiple sensations, multiple affective states, multiple corporealities within myself and across bodies. From the "carefully scripted performances" that we enact in "omnisensory" public spaces to the conviction that images, objects, and spaces perform for, with, and in spite of us (ibid., 2002, 122), explicit references to performance and choreography populate approaches to bodies, mobile technologies, and urban spaces, and not just from theater and dance practitioners. Locative media artists, geographers, sociologists, and philosophers of technology are increasingly attracted by notions of social choreographies or performative corporeal acts in order to account for the multiplicity of bodies networked across the physical and the digital.6 The idea of flesh that has filtered through the previous chapters in this book will be even further "fleshed-out." Social choreographies as revealed by iterations of the whisper[s] project will be used as a lens to examine and critique discourses around locative media in urban spaces, and the streak of abjection inherent in wearables research will be revealed.

Data Choreography

Performative approaches to wearables can be adopted as critical strategies to explicitly celebrate the closeness of bodies and computers by remapping the expressive and corporeal conventions seemingly hardwired into our devices or systems. All of our devices invite a set of physical gestures either determined by the data they convey (voice, text, visuals), by ergonomic (or non-ergonomic) design, or by the set of codes communicated across distinct social groups indicating how to use and wear devices in different social settings (the club, the subway, the library, the boardroom). The mobile phone is a vibrant example: do people hunch into it or speak loudly as an indication of social or financial status, hide it in layers of clothes or expose it, place it on their desks beside them or dig in the bottom of their bags for it? Is it set to ring loudly or softly, or is it almost never switched on?7 Qualities of performance--ephemerality, expressivity, humor, poetry, physicality--integrated into the design and use of wearable devices can act to disrupt, to delight, and to challenge conventional uses of devices, databases, and networks. Choreographing the flow of data involves being aware of what it is, who receives it, when and in what form, according to which rhythm, and whether of narrative or affective quality. Choreographing my data, whether my movement patterns, my voice, my scribbled thoughts, or my heart rate, is like saying I want to play with my data and yours, to flirt with them and with you, to abstract and shape them into expressive portrayals of who and what I am, and of my relationship to you. Data choreography across social contexts contributes to an emerging and adaptive poetics, a chiasmic aesthetics of disappearance and exchange across the physical and the digital, where stillness and quiet in data exchange are as integral as acceleration, and discontinuity and disruption are as important to the ontology of human corporeal exchange through digital devices as are continuity and connection. It is politically and choreographically significant for me to make a choice for my data to exist in a certain manner, and then for it to disappear or to be transmuted. If I want to preserve it, I can choose its modality and location: I may translate an affective state into a simple melody and save it as an MP3 file, but I may prefer heartbeats to be preserved as memories, floating and frayed over time. This is the approach to social computing offered by this book: it is viewed in terms of the rhythms and flows of immanent states radiating outward.

Data choreography is about transubstantiations, such as those that Merleau-Ponty claims occur when I lend my body to the world, like the artist. And I do this, all of us do this, by being visible and mobile. My mobile body, "the nervous machine," inheres in the world, gets caught up in things and others in the world (Merleau-Ponty 1964a, 162–163). Hubert

Godard, whose research in neurophysiology and somatics rests on a foundation of dance and philosophy, once asserted: "The body does not exist, we are nothing but connective tissue."8 His words, which I initially resisted, left such an impact on my way of living in my body that as I sat quietly in a room the following day I felt my skin dissolve and tendrils of my body reach and wave in the space. I also felt a raw vulnerability, for the dissolution of my armor of skin meant not only that I could extend into space but also that what was beyond me could reach into me: permeate and germinate. For a moment I became nothing but nervous system, a nervous machine. The myth of the self-contained body collapsed into dust around my feet, my body was truly "caught in the fabric of the world" (ibid., 163), and this fabric was the connective tissue, or flesh, of my body, things, others, and the space between things.

Merleau-Ponty's idea of flesh is not based on the suggestion that everything is made of the same substance, like atoms, ether, or blue cheese. Such a notion would have little scope for movement, for choreography. It is concerned with active perception and living in the world. Flesh is both visible and invisible. Flesh is not just that which is seen or felt, it is the very reason we can see or feel at all; flesh sustains the chiasmic relation with the world according to which I see and am seen, touch and am touched; it is the means of communication between ourselves and the world. Viewing flesh as connective tissue helps to escape the tendency to think of flesh as lumpish matter; when Merleau-Ponty says that flesh "is not matter, is not mind, is not substance," that it is not visible, "it is not a fact or a sum of facts 'material' or 'spiritual,'" we are put in a position of having to infer flesh by skirting what it is not (1968, 139). The reason for this is that flesh is lived, it is not a category or a thing. When flesh is experienced through our embodied engagement with the world it exists across the senses and across all our connections with people and things. It is possible to understand it as a dynamic web of perceptual and behavioral relationships. Human connective tissue, "the binding, strengthening, connecting, and separating web," is a compelling vehicle for understanding the wider philosophical concept of flesh (Myers 2001, 25). Flesh operates on physical, social, dynamic, infrastructural, and metaphorical levels, allowing us to extrapolate from connective tissue to bodies, objects, societies, cities, and ideas.

This is where it is useful to begin to think of connective tissue as a network, or as a set of networks, and to direct our awareness at the gaps or latencies within their fabric, seeing them as fluid and dynamic. Data choreography can take place at all only because we are connected, not just through our telecommunications networks but through physical, affective, and social networks. As sketched in chapter 1 discussion of connective tissue and fascia, networks are

more than ways for us to maintain connection; they are ways for us to maintain distance, or to engender difference. The difference in our physical bodies is eroded by static perceptual and anatomical models as subtly and thoroughly as difference in our cultural bodies is eroded by homogenizing social and political categories, but human connective tissue maintains both dynamics: "Through fascia, everything in the body is both unified and differentiated" (Maitland 1995, 223). Human networks, in particular social and corporeal ones, do not operate on the basis of clarity and sustained connectivity alone: they are systems of ebbs and flows, with secrets, dark spots and attenuated periods of waiting, in counterpoint to the dizzying speed manifested by rapid flashes of shared insight or moments of seeming telepathic connection. The flesh of things is more about the gaps between them than their substance, "--less a color or a thing, therefore, than a difference between things and colors, a momentary crystallization of colored being or of visibility." Merleau-Ponty locates tissue between visible things, something that "sustains them, nourishes them, and which for its part is not a thing, but a possibility, a latency, and a flesh of things" (1968, 132–133).

Human connective tissue is a living metaphor for broadly construed physical, social, and digital networks. If we accept a Merleau-Pontian understanding of incarnation as an intercorporeality, my body is always already caught up in the fabric of the world and there are traces of the other in me. On the basis of this my connective tissue does not stop at the boundary of my skin; it is a lattice that embraces my interactions, or choreographies, with people, animals, devices, memories, and thought. Choreography is about variation and relations, between bodies in space and time. Merleau-Ponty's description of the color red reveals an understanding of choreography that can be mapped onto the exchange of data: "this red is what it is only by connecting up from its place with other reds about it, with which it forms a constellation," and it attracts or is attracted by other colors, repels them or is repelled by them, dominates or is dominated by them, existing as a "node" in the temporal modalities of the simultaneous and the successive (ibid., 132). This dynamic of attraction and repulsion, sharing and containment, forming a shifting constellation across time is a way of understanding the data choreography fostered by wearable devices.9 My body may not exist, nodding to Godard's provocation, but as connective tissue I live an even greater space of potential, an expanded corporeality that is permeated by interstitial spaces that I reach across in hope and in vulnerability, sometimes in lust and anger, or that I seek to stretch in fear or pain. I am like the color red inhabiting elastic zones of interface between myself and myself, or between myself and others. Performance occurs in these interstitial spaces, both everyday performances and artistic performances.

4. Researching this section in the British Library in July 2005 just after the London bombings I was chilled by the so-called stealth bills appearing in the British House of Commons, which would enact infringements to civil liberties in the name of security and the "war on terror." Emerging immediately after the bombings these had obviously been under construction for some time. The national identity card scheme, which made so many members of the public and politicians uneasy, resurfaced, combined with a plan to instigate draconian new immigration legislation that called for biometrically tagging new Muslim immigrants and workers in Britain, only allowing refugees five-year time frames before having to be vetted once more, increasing resources devoted to policing, and infiltrating communities with officially sanctioned informers. It will not be long before many western countries will hold records of DNA and medical data not only for their own citizens but also for those who visit the country as tourists, or certainly those who may be deemed terrorists or simply outside the mainstream.

5. Heterophenomenology is defined and explained in the first chapter. In brief, it is what can be called a second-person approach to reflecting upon lived experience. Instead of the phenomenologist directly reflecting upon her immediate experience, she reflects on the experiences of others but filters the descriptions through her own body. This is not a detached third-person approach; it attempts to respect the experience of the other as it resonates with personal experience or perceptual information or knowledge.

6. Locative media refers to location-aware mobile devices, such as mobile phones that utilize a range of location-sensing technologies: GPS, WiFi triangulation, WiFi and Bluetooth XML feeds that broadcast location information, phone location finding, and conventional-current cell tower locating. On a practical level, a device can ascertain its position (and your position if you have the device with you) by multiple means, both indoors and outdoors and to varying degrees of accuracy. On a poetic and artistic level it is possible to stitch together layers of media (such as sound and visuals) with the flows of people carrying devices, or to embed narratives in landscapes reflecting hidden histories or neglected sources of affect and meaning accessible by devices. See the Leonardo Electronic Almanac issue devoted to locative media: http://leoalmanac.org/journal/vol_14/lea_v14_n03-04/.

Corporeal Telepathy

The words attention and intention come from the Latin root tendere, to stretch, as in tense and tension. Attention comes from ad + tendere, literally meaning "to stretch (the mind) toward." Intention comes from in + tendere, "to stretch (the mind) into."
--Rupert Sheldrake, The Sense of Being Stared At

Mobile phones transmit voice, text, images, and sound. PDAs preserve and manipulate the more rational, organizational aspects of our personalities and lives. The convergence of the two allows for the search and exchange of a wider hypertextual amalgamation of data. But what of the truly nonverbal layers of our communication? What about the way our communication occurs on the threshold between the tangible and the intangible most of the time, between that which can be articulated and that which escapes language? The design of the whisper[s] project is based on a sensory computational platform affording the choice to attend to one's physiological data or affective corporeal state and to send it to another as a poetic amalgamation of sound, visualizations, and haptics. A loose acronym, whisper stands for wearable--handheld--intimate--sensory-- personal--expectant--responsive. Motivated by the desire to facilitate nonverbal communication through our mobile devices, to expand the idea of wireless local area networks (WLAN) with an awareness of sensory body area networks, and quite simply the desire to wear responsive, sensual computers on our skin, the whisper[s] project provides the experiential basis for reflections upon flesh and data choreography. Still in the process of being developed, the project in its current state offers garment wearers a range of possibilities for intention and attention. For example, an inwardly directed intention to listen to breath and to translate this into outwardly directed attention to others is achieved by means of a respiration sensor in a personal garment and haptic outputs in the garments worn by others. One person's breath causes vibrators and fans in the lining of another person's skirt to come alive with its corporeal rhythm. In addition, the collective breathing patterns of a group of participants is translated into a shared sound composition, effectively a sonic representation of an ecosystem of breath.

With uncanny prescience to the proliferation, fifty years later, of devices and technologies worn close to our skin or in our bodies, Merleau-Ponty wrote of things "encrusted" in our flesh. Things, he wrote, are "an annex or prolongation" of the body; "they are en-crusted into its flesh; they are part of its full definition; the world is made of the same stuff as the body," (Merleau-Ponty 1964a, 163). My body is a thing among things because I see but am seen, by myself and by things. Things see me, whether or not they are intelligent devices with sensors or cameras. This was neither a fetishization of the machinic that characterizes much of cyborg discourse, nor an assumption that this proximity with things heralded the demise or obsolescence of flesh. It was Merleau-Ponty's strong statement of the body's belongingness to the world. That which I sense also senses me, whether this is person, animal, or machine. In other words, to feel one's body is also to feel its openness to the other: the other's capacity to receive sensory information from me is implicated in my own sensoriality. It is as if communication flow to and from others is hardwired into my very structure; I moderate and regulate, decipher and interpret, inhale and exhale, sensing my own and others' bodies at all times. I do this according to a sort of perceptual telepathy, or with the assistance of telecommunication devices. In a little cited and hard to decipher working note to the The Visible and the Invisible, Merleau-Ponty refers to telepathy as a state of being for the other, he writes that "to feel one's body is also to feel its aspect for the other." This telepathic connection is not the popularized version of a latent message conveyed between two beings by psychic means; it is simply that "the other's sensoriality is implicated in my own" (Merleau-Ponty, 1968, 244–245).

"Wearables for the telepathically impaired" is the phrase the artists of the whisper[s] project use to describe the intelligent, sensory whisper garments. When anyone has not quite understood the garments' complex technological configuration, or grasped the array of concepts, this quasi-ironic but strikingly apt phrase has a way of making them nod their heads as if to say "Aaaah, now we get it. Why didn't you say so from the beginning?" It implies that contemporary Western bodies have forgotten the full scope of our ability to transmit and receive qualitative and affective messages from one another, and that wireless wearable devices can step into this lacuna to help us regain these sensory and cognitive data flows.10 Slightly adjacent to the notion that we have these channels of communica-tion but have simply forgotten them, or do not have the techniques of awareness to tap into them, is Rosalind Picard's suggestion that technologies might increase affective bandwidth. With a particular emphasis on virtual environments, she writes that "computer-mediated communication might potentially have higher affective bandwidth than traditional 'in person' communication" (Picard 1998, 57). While the whisper[s] approach is based on a similar belief that computational systems can augment human communication if they are designed to handle a broader range of human qualities, her view of affective computing is concerned mainly with emotion or mood. We are working with a wider affective palette, and perhaps a somewhat different definition of affect. This is revealed when telepathy, as "distant feel-ing," is seen to be an anticipation of the other's perception, intuition, or thoughts as well as emotions. It is not only an indication of the presence of what Merleau-Ponty calls the "imminent, the latent, and the hidden" channels of communication, but also reveals that I am profoundly connected to others by how I sense and live in the world (Sheldrake 2003).

Amplifying the poetic capability of our mobile devices and their convergence with our bodies, both in what they convey and how they are worn, are two of the goals of the whisper[s] project. So too is recognizing the increasingly performative, playful, and intimate roles our devices play in our lives. Invisible layers of emotion, physicality, vitality, imagination, gesture, and attention act as the glue of human exchange. Inherently nonverbal and on the fringes of the visual, new mobile devices are required to access and transmit this data offering different configurations of sensors, actuators, and networking protocols. Wearable devices as they are networked together, between bodies or traversing a single body, bear witness to our constant exchange with alterity as a form of having-the-other-in-one's-skin (Diprose 2002, 115). Developed collaboratively across dancers and engineers, the whisper[s] devices emphasize techniques of attention and intention: the devices encourage the wearer to direct their attention to the more subtle layers of physicality and consciousness, to be aware that these layers exist quietly beneath the overt mental chatter of daily life. Not unlike meditation techniques, the use of wearable devices provide a means to redirect attention and to communicate, if we choose, the more subtle and affective currents of our beings to others. As with dance, techniques for listening and expression that animate the whisper system result in gestural and choreographic patterns across clusters or networks of bodies. It is this way that techniques for listening and sharing inner body states result in social choreographies.

7. This is not a cultural anthropological approach to the use of mobile technologies. It is performative and philosophical, with the intention to impact upon the design of specific systems. Some good cultural and anthropological approaches to mobile phones exist. See Agar 2003 and Ito, Okabe, and Matsuda 2005.

8. This comes from a conversation with Godard at the 2007 "Recherches--En danse" conference at Le Mas de la Dance, The Centre for Study and Research in Contemporary Dance located in Fontvieille, France, directed by Françoise et Dominique Dupuy. See http://www.lemasdeladanse.com/fr.htm.

9. This approach to the dynamics of data choreogra-phy has some affinity to the study of movement of-fered by the sociological approaches of kinesics and proxemics dating back to the 1960s. Parakinesics, in particular, is concerned with qualitative modifications of movement such as intensity, duration, extension, and interactions with others (Bernard 1995, 128). Mi-chel Bernard has integrated a review of sociological approaches to movement in his book on corporeality. Rudolf von Laban also has complementary approach-es to deepening the understanding of movement that have become quite popular in human-computer inter-actions fields (HCI) when taxonomies of movement are required to facilitate the writing of computer programs (Laban and Lawrence 1947; Laban 1966, 1992).

Affective Computing

Now it is inside the body that something is happening; the body is the source of movement. This is no longer the problem of the place, but rather of the event.

--Gilles Deleuze, Spinoza: Practical Philosophy

The decision to design wearables based on the combined infrastructure of the philosophical notion of flesh, choreographic patterns of social computing, and the expression of affective body states is, for the most part, distinct from the approaches to wearable computing offered by disciplines such as engineering and medicine. Picard identifies a dominant stream of research into the miniaturization of computers worn on the body as motivated by the goal of creating the ultra-efficient worker. This is often achieved by means of the cumbersome and quite old-school cyborg approach to wearables that simply involves strapping a computer to one's body by distributing its components of processor, camera, keyboard, or keypad onto limbs, head, and torso. "Today's wearable computers are more suited to the natural ways of businessmen, maintenance workers, medical patients, and consumers who would like to consolidate their cell phone, laptop, pager, camera, and Walkman into one easy-to-wear device" (Picard 1998, 227). This approach to wearables generally regards them as always-on, always-running presence-aware systems that facilitate actions and occasionally perform tasks without the wearer being aware.11 A defining characteristic of wearables designed and used in many corporate and scientific settings is that they manage a steady flow of communication (Web browsing, email access and composition, receipt and transmission of visual and sonic feed, storage of media and personal playback, and in some cases muscular control of robotic devices, both large and delicate). Wearables are part of new "information ecologies" in cities that may combine heterogeneous spaces in unforeseen ways, but that contribute to immunizing our society against disorder, with both beneficial and worrying side effects (Amin and Thrift 2002).

This array of functionality is addressed by Picard in Affective Computing (1998), adding her contribution of emotions to the mix. According to her argument, affect equals emotions and computers do not have to have emotions in order to be able to communicate emotions. Calling attention, as she did, to emotions amid this array of functionality was invaluable, and devoting resources to designing physiological inputs for computational systems is relevant to a broad range of applications. Artistic approaches to wearables may use similar functionality, but when the questions "why do we want this device" and "what do we really want to communicate" are asked, different answers tend to arise. In a revealing side comment, a designer who worked intensively on a wearable computing dress and was coming to grips with its utter lack of market success said, "nobody wanted it...not because it was too expensive...who wants to have your mobile phone and MP3 player with you all the time?"12 Functionality and efficiency are crucial for certain professional applications: nobody wants a surgeon wielding a robotic scalpel by means of a wearable device with a large margin of error, but other applications speak to the less functional realms of imagination, poetry, and science fiction. Viewed in this way, wearables may have more in common with fashion and entertainment and less in common with time- and labor-saving gadgets.

Fashion can be about many things, but for the story I am telling here what is important is fashion's potential for materializing imagination, its seasonal ephemerality, the ability for style to respond to a corporeal and affective state one day and not the next, and the different ways we perform and express ourselves when we wear one garment and not another. Wearables are worn close to the body because we want them to be there; we invite them to be there and to share our personal space with fluid and transforming expectations. It is here that they rub shoulders with domains of body modification and prosthetics: techniques and technologies of the body, from martial arts to robotic arms, outline and amplify the metaphysical structure of our flesh (Merleau-Ponty 1964a, 168).13 The poetic aspects of wearables are set in motion by design decisions from the earliest stages of development. Even a lack of attention to sensuality, kinesthetics, or poetics is, by default, succumbing to a particular look and feel. The conditions for a particular poetics are set in place by decisions to make the circuitry and wiring softer, pliable; to create degrees of responsivity and configurability; to make the wearables subtle or even hidden. Designing with an awareness that by means of a wearable device we enter into a duet with ourselves as well as with others is designing from the standpoint of flesh, as is affording the ability to alter its modes and functions, to take it off, and, crucially, to switch it off. It is for this reason that configurability holds a place of prominence in the whisper[s] design specifications. Over time the devices may resemble a cross between cyber-jewelry, exquisite art objects, creepy prosthetics, peculiarly ornate theatrical costumes, and body sculpture, but at the same time they are intended to offer maximum configurability accomplished by "plugging in" components (like respiration or heart sensors), and by mixing and matching functions within a modular system. Basic analogue devices like vibrators can be used alongside more sophisticated components (including biofeedback--or brainwave--sensors). A wearer may configure their "plugout components" to vibrate, tickle, or sigh when they receive data associated with a particular pattern set. (Kozel and Schiphorst 2002).14

Bachelard could have been reflecting upon a poetics of affective computing when he wrote that we are "half open" beings in that we want to be "both visible and hidden," and because our "movements of opening and closing are so numerous, so frequently inverted, and so charged with hesitation" (1969, 222). The inversions, the hesitations, the desire to be secret and then to reveal: these motivate the choreography of the self and can inspire the design of wearable devices. The affect in affective computing begins with emotions, and sometimes with other ambiguous body states, but spirals outward into the domain of social choreography. Redefining affect, or at least providing multiple definitions, is important in order to promote the design of a broader range of computational systems, wearable or not. Affect is not just mood: happy, sad, angry, lustful. It reflects an ontological state. Diprose's Merleau-Pontian inspired understanding of affect sees it as an acknowledgement of our being embedded in the fabric of the world alongside others. It is "the expressive operation of a body that knows nothing of a division between self and world or between the expression and what is expressed" (2002, 101). Suddenly, affectivity is more about intercorporeality than the identification of a mood with an individual, and we find ourselves in the "pulp of the sensible," in which what is indefinable "is nothing else than the union in it of the 'inside' with the 'outside,' the contact in thickness of self with self" (Merleau-Ponty 1968, 268). And of selves with other selves.

10. A range of artists over the years have explored telepathy or related states in the context of responsive systems. A highly limited sample includes Camille Baker, Diana Domingues, Diane Gromala, and Kathleen Rogers.

11. This approach came to the fore in the 1990s and still pervaded the human-computer interaction community in 2006 as evident by the papers on this topic given at SIGCHI 2006 in Montreal.

12. I can't provide his name, but in his opinion a different design approach is required in order to make wearable computers marketable in the worlds of fashion and smart objects. We do not simply want more of the same functions provided by existing devices all compiled into a comprehensive armor.

Conjunctive Tissue of Visibility

The red dress a fortiori holds with all its fibers onto the fabric of the visible, and thereby onto a fabric of invisible being.
--Maurice Merleau-Ponty, The Visible and the Invisible.

The whisper[s] project has had three iterations, each with slightly different user interface, hardware and software platforms, and garment design.15 The participatory installation format of each public exhibition did not rely on performers, but invited members of the public to don garments embedded with small wireless computers and pulse and respiration sensors. Once dressed, participants entered a space defined by light, sound, and movement. As people accessed their own breath and heart data through simple gestures and sent this data out into the space as mathematical visualizations, or "gave" this data to another person, relationships were revealed: between self and self, self and other, and self and ecosystem. The whisper[s] installations were unusual because they immersed people in environments affording them the choice to externalize and communicate their internal flows and rhythms--something normally done in private or without this degree of conscious awareness. The qualities of attention and affect exhibited by participants wearing the garments as they grasped the physical and conceptual elements of the pieces were palpable. It was as if people listened to, and interacted with, their own bodies and the bodies of others in entirely new ways. Bodies were revealed across a pattern of human relationships where wider relationships were based on the initial discovery of a relationship between the self and one's own hidden layers of meaning.16

The gestural vocabulary around accessing the data for the first version of whisper[s], called whisper, was shaped by a less than desirable design prototype. The jacket-shaped garment had snap connecters located on fingertips and these connectors had to be joined with snap islands on the garment, or on someone else's garment, in order to close a circuit and select one of a range of choices: breath, heart, or a combination of heart and breath. The decision to give data was enacted by snapping onto someone else's garment; it was impossible to take another's data because the system was designed to prevent this. The data was obtained by medical sensors embedded in the garments (a breath band around the rib cage and a pulse sensor on a fingertip) and, in turn, was transmitted by a custom-constructed Bluetooth wireless device embedded in the garment to a server that housed the database of mathematical visualizations. The visualizations were then projected into video pools in the space, shifting in real time according to the patterns of the breath and heart rate of one or more people. Looking at the visualizations of participants' bodies was strangely intimate, and once again the uncanny way responsive performances using digital media have of providing physical examples of philosophical concepts was evident. Luce Irigaray writes of the "con-

13. Caroline Evans in her book on fashion at the end of the twentieth century adopts a complementary metaphysical approach in her expansion of the standard categories of fashion criticism by reflecting on ontological states such as life, death, pain, cruelty, and haunting (2003).

14. At the time of writing, the whisper[s] platform had not achieved the full degree of functionality or configurability. Development issues relating to soft circuitry and power sources (small, long-life batteries), and the question of porting to a mobile phone platform were being addressed. Questions of battery power and circuitry that can sustain multiple washing and folding of garments are significant. See work on electronic textiles and wearable technologies by Joanna Berzowska and collaborators Vincent Leclerc and Marcelo Coelho of XS Labs at http://www.xslabs.net.

15. The first iteration of the whisper[s] project was simply called whisper and was part of the Dutch Electronic Art Festival (DEAF03) in Rotterdam and of Future Physical in Cambridge, U.K. in 2003. This emerged from a residency with V2 coordinated by Anne Nigten with substantial valuable engineering input from Stock of the V2 Lab. The second iteration was called between bodies and premiered at the Cibera@rts festival in Bilbao, Spain (May 2004). In addition to the core whisper[s] research collective indicated in the note above, between bodies garments were designed by Gretchen Elsener and experience design workshops facilitated by Camille Baker. The final iteration as I'm defining it here was called exhale, included in the Emerging Technologies exhibition at SIGGRAPH 2005 in Los Angeles. For related writing, see Schiphorst 2005 and Schiphorst and Andersen 2004.

junctive tissue of visibility" based on the visual becoming visceral. The space of the installation felt like a collective fabric, with each person's gaze seeming to be "a connective tissue between the interior and the exterior, but formed inside…formed within the living tissue of my body" (Irigaray 1993, 156–157).

This first design was less than desirable because the garments and their interface were distinctly nonsensual: they looked like lab coats and the gestural vocabulary to emerge from the necessity of snapping into place to get the system to respond was fussy and disjointed. The second iteration of whisper[s] was called between bodies in order to give awareness of the thickness of space and ambiguity of meaning of intercorporeal space. Both men and women were invited to put on lush and eccentric skirts embedded with small fans and vibrators such as those embedded in mobile phones. Garter belts under the skirts read muscle contraction and caused the muscular movement of one person to animate the fans and vibrators in the skirt of another person, or of a group of people. The decision to focus on tactile or haptic outputs was born of an awareness that the visualization of body data output of the first version of whisper[s] somehow limited the gestural and imaginative interaction. We needed to escape the visual in order to enhance the kinesthetic and tactile, to draw people into different qualities of awareness that did not privilege vision. By focusing on the tactile we created a shared experience that was far more playful than the first iteration of whisper[s]. This could be due to the collective wearing of skirts and the social connotations around vibrators, but there was something about the immediate physicality of wearing motion from the body of another on one's skin that drew the interactions into another dimension As Irigaray says, the tangible is a vast landscape that cannot be enclosed in a map: it is "the matter and memory of all the sensible" (1993, 164).

The relationship between oneself and one's own physiological data, the self-to-self relation, was the first revealed once participants put on the garments. There was a delicate listening quality to the first few gestures that made connection with the locations on the body that caused an individual's heart, breath, or combined heart and breath to be projected outward. Hesitant, listening: it was like discovering the self anew, entering into a gestural dance with one's own body in order to access things that were intimately familiar but strange at the same time. Then the moment of registering the connection between the behavior of the visualizations projected in the space and the motion of deeper layers of the body was palpable, with some people even articulating aloud: "that's me." The relationship between self and self was fundamental to the experience because it set in place new modalities of attention and intention with respect to one's own body: a state of listening or attending to the biological and affective flows of one's body preceded the intention to share these with another body or map them into the space. In this respect it

is evident that performance practices and other physical techniques lie at the very heart of this project, for the shift of state of attention to the body and space through breath and focus are fundamental to dance, yoga, meditation, and other intuitive or expressive physical techniques. Like an archaeology, layers that were concealed rose to the surface through the gestures and attentive practices of the whisper[s] project, but there was never an imperative for all the hidden depths to be exposed fully. A dynamic akin to Maurice Merleau-Ponty's visible and invisible was at play in the way that dimensions of a person's physiological data were rendered visible, but the full richness of the body was left in an implicit or immanent state. Merleau-Ponty indicates that modes of exhibition of sound and of touch have points of intersection with the visible world but remain in the disguise, or in the secrecy of the invisible. He suggests that this is how touch and music, along with literature and love, exist for us in the sensible world.

The second relationship to be revealed was that between self and other. It was clear that the act of giving physiological data to someone meant different things to different people. Some people were fundamentally uncomfortable with the procedure and chose to remain engaged with exploring their own data. Some people only engaged with the friends with whom they entered the installation, while others quite happily regarded all participants (up to eight at a time) as worthy of exchange. It was imperative for us, the authors and guides of the installation, to create a safe habitat for experimentation: we referred to what we created as an ecosystem. In Heideggerian terms it can be seen as a place of techne, of bringing forth, and it reflects the sense of technology providing an "enframing" for being (Heidegger 1977, 20). The ecosystemic nature of the piece, reflected by the third relationship to be revealed, that between self and ecosystem, became clear through the amalgam of relationships evident when the space as a whole was observed. Participants visiting the space entered a community of bodies and objects whose functionalities were not yet manifested. They were invited to take their place within this ecosystem and create the relationships. People, garments, pulses, breath, muscles, visualizations, and haptics and sound became a shifting, complex system. Elements of collective vocabulary emerged from the design of both systems: with whisper[s], reaching and wrapping arm gestures, looking down at the floor, embraces and slow traversals of the space prevailed; with between bodies, crouching, hands pressing onto the sides of thighs, brushing up against others, and gazes shared between individuals were more in evidence. Yet both systems afforded the scope for individual choice to create a counterpoint within the tendencies of the whole, such as the choice to run, to connect several beings into one creature, to sit or lie on the floor, to remain completely still. These ecosystems were fundamentally social, and the gestural vocabularies to emerge can be considered social choreographies.

A Force Field of Passions

An architecture that is created by people through its use, as a performance, a conversation, a bodystorm.

--Usman Haque, "The Choreography of Sensations"

Pursuing the suggestion that wearables enable a dissemination of immanence by means of intention and attention, the question becomes whether wearables converge with locative media once immanent states radiate outward into shared social spaces. Once the ebb and flow of personal information are mediated by portable, location-aware technologies, like mobile phones, GPS, and Bluetooth, the argument that wearable computing becomes another strand of locative media and open-source digital architectures confronts the argument that it is more accurate to construe wearables as a distinct domain. Drew Hemment calls locative media a "'test category' for the convergence of geographical and data space," and "a prescient metaphor for the latest technological zeitgeist." While he and other artists and researchers working in this area recognize that locative media can be broadly understood to include "bodily, technological and cultural components, combining cultural practices and the embodiment of the user, with various 'media' and location sensing technologies" (Hemment 2006), there is still a fascination with dissolving the materiality of bodies, cities, and structures into fluctuations and permutations of socially generated digital data. Locative media is a creative morph of cartography and geography with digital imagery and database programming, piggybacking on mobile networking technologies, and many of the more compelling projects exhibit a political spirit of social activism and situationist art revised for the new century.17 As Sally Jane Norman points out, much locative media art enacted in social contexts borders on the subversive or illegal and is interwoven with well-articulated political or ideological agendas. This constitutes a huge part of its appeal

and allows it to be placed within a history of theatrical practices (Norman 2006).

A pivot in the discourse is Ben Russell's iconic, and often cited, poeticism that with locative media it might be possible to "search for sadness in New York" (1999). A highly personal, highly collective emotion, sadness can be seen to hang in spaces, to shift like clouds, and to infect people. Even animals can exude sadness, so why could we not find techniques to map it, or browse for it like we might for un-password-protected WiFi bubbles in cities we visit for the first time? Sadness is placeless and amorphous, but it is also deeply embodied. Russell's take on locative media is pivotal because he sees it as virtual at the same time as physical, and as viewed from the outside at the same time as subjectively experienced. This second designation is important because it reflects the focus of this chapter: not only an emphasis on data choreography as social computing, but also on the phenomenological (or heterophenomenological) perspectives that consider locative media from a particular approach to bodily affect and immanent states. It already is not uncommon to find designers and writers deploying the terms performance and choreography to distinguish their perspective from more static and less embodied approaches to media. Architect Usman Haque's poetic and articulate essays on open-source architecture integrated with participatory architectural structures rely heavily on the fluid dynamics of choreography. He writes of "choreographies for openness," in a way that applies extraordinarily well to the social ecosystem of the whisper[s] project, indicating that these require "group instructions...interpreted and modified as necessary by participants, individually or collectively," and further, that participatory or interactive systems encourage a constructed project "to be constantly 'patched' or 'performed'" (Haque 2004a). Assuming a readership of architects, visual artists, programmers, and designers, Haque's words seem con-

structed strategically both to provoke and to inspire, and his writing, like Russell's, has the feel of a contemporary manifesto: "Architectural design, the choreography of sensations, can provide meta-programs within which people construct their own programs" (ibid.), and as such it "changes over time and responds to changes over time" (Haque 2004b).

Complementing the sensory perspectives of Russell and Haque is a more intensely phenomenological stance, taking into account the experience of locative media from the first-person perspective, and expanding a notion of affect from the inside out. This shift to a more fully phenomenological perspective from one that sensitively identifies sensation from the outside can be clarified by returning once again to Merleau-Ponty. He writes of how, for the one who experiences colors and textures of the world, the space and time of things are "shreds of himself, of his own spatialization, of his own temporalization, are no longer a multiplicity of individuals synchronically and diachronically distributed, but a relief of the simultaneous and of the successive, a spatial and temporal pulp where the individuals are formed by differentiation" (Merleau-Ponty 1968, 114). This passage, sometimes isolated to demonstrate a profound solipsism, is really an indication of the tenacity to which Merleau-Ponty holds onto the phenomenological position by which the choreography of sensations that is the world can only be experienced and understood through the body of the one embedded and perceiving, not by an external choreographer.18 When this is combined with a deeper understanding of affect, such as the one offered by a Deleuzian reading of Spinoza, the bridge between locative media and wearables can be further strengthened.

Spinoza offers a "physics of bodies in which the human body is not a self-contained whole but is built out of other bodies with our own" (Amin and Thrift 2002, 84). Affect takes into account the alchemy of other bodies with our own, and make us more intensely aware of our own "desires, joys

and pains" (Gatens and Lloyd 1999, 14) Affects are passions for Spinoza, including hatred, love, sadness, joy, anger and envy. As a subclass of bodily "affections," affects involve increases or decreases in the body's power of acting, and most significant for this discussion of locative media, affect refers to the passage of the body from one state to another as the body lives and acts in the world (Lloyd 2004, 72). Affects are states of transition and can be viewed, like data choreography previously articulated, as transubstantiations. Affects from the past also live in our bodies as traces of encounters with others. An affect implies the presence of the affecting one or ones. What is noteworthy here, apart from affects being bodily states and transitions, is that they are inherently social. Amin and Thrift, geographers proposing a sophisticated articulation of cities as performative spaces, indicate that affect provides an "artful dimension to interaction," taking into account body stance, corporeal social logic, and improvisation (2002, 87). Like Diprose, but using different terms, affect is located in the interaction between bodies in social contexts. Affect acts as a "temporary flesh for the passage to an altered state of social being" (Katz 1999, 343). The significance of affect not being simply reduced to emotion should be clear by now. Construing it dynamically as a transition and socially as the relations between bodies means that affect can be viewed from the outside as fascinating patterns in space and time, or it can be reflected upon from within, in an attempt to palpate immanence from within.19

As compelling as Amin and Thrift's discussion of affect in cities may be, they do not associate it with wearables. For them, wearable computing

is located in the domain of simple flow of information in a city that is ultimately disembodied. Relying on a definition provided by Donald Norman, they situate wearables within a computational and functional domain that includes ubiquitous computing, indicating that the key application for so many of our mobile devices is a diary, and, more controversially, suggest that these devices and systems mimic human bodies and simulate affect (Amin and Thrift 2002, 102–103). We might legitimately ask whether affect is simulated by our wearables and our locative media devices that reflect patterns of social behavior, or whether "real" affect is conveyed or represented by them. Diprose helps us escape this conundrum by suggesting that affectivity, like sexuality, is "an amplification of tensions, resonances and metamorphoses" that take place in the intercorporeal world of perception (2002, 103). Returning once more to the suggestion that we might be able to search for sadness in New York, affect can be regarded as so tangible, so searchable, that it appears as a "new term" between oneself and the world, a "new texture in the social moment," which has the qualities of an emergent and transforming body (Katz 1999, 343). If devices are inserted into this intercorporeal world, they enhance the amplification process. They do not insert affect where none existed before, but they participate in a city that, made up of people and devices, becomes "a force field of passions that associate and pulse bodies in particular ways" (Amin and Thrift 2002, 84).

The view of affect as referring to a passage from one state to another can be mapped onto mobile, locative media as they encourage or inhibit human exchanges. They are fluid, they are portable, they accompany us

for hours, days, and seasons, which means they span moods and activities, cycles and rhythms of life. We integrate these little devices into our clothing (pockets and bags) and our daily gestures include the arm, head, and spine movements associated with using them. We walk and see differently when we use them. Even with something as basic and ubiquitous as a mobile phone, our senses are repatterned, our feeling for space and time folds inward or leaps outward. We carry the other with us, in our hearts, in our memories, in our devices. It is not at all surprising that the researchers and designers active in this area struggle to find vocabulary to describe what is happening, not at all surprising that they stumble across terms that are intimate to dance and theatre: performance, choreography, and improvisation. The question of whether wearables can be associated with locative media is less pernicious once the terms of the discussion are taken to a deeper level of affect. The whisper[s] installations were designed to be landscapes of emanations from a multiplicity of people and devices. Deleuze's reflections on Spinoza help to reinforce a notion of social computing that permits an attention to immanence at the same time as an understanding of social choreographies. Relations can compound "to form a new, more 'extensive' relation," such as many people using mobile devices in a single city, but something else may occur: "capacities can compound directly to constitute a more 'intense' capacity or power," such as the principle of telepathy upon which whisper[s] is based. Reflecting a Spinozan notion that a body can be anything from an animal, to a body of sounds, to a collectivity, Deleuze reminds us that "it is no longer a matter of utilizations or captures, but of sociabilities and communities" (1988, 126).

16. Much of this section appears in a essay published by Performance Research in the context of a longer discussion on techne. See Kozel 2006a.

17. Leonardo Electronic Almanac 14, no. 3 offers not only a collection of essays on locative media but also an online curated Locative Media Gallery at http://leoalmanac.org/gallery/index.asp. ISEA 2006 (International Symposium of Electronic Art) and ZeroOne San Jose also exhibited a range of work relating to locative media and urban spaces, see http://www.isea-web.org/ and http://www.01sj.org/.

18. Strictly speaking, even the heterophenomenological method I propose according to which an empathic outsider can translate another's phenomenological experience is a deviation from a Merleau-Pontian approach. For many years I espoused a strict view that a phenomenology could only be performed by one person of their own experience, and not of another person's experience. I am grateful to Leena Rouhiainen for instigating a loosening of my position.

Yes or no: do we have a body--that is, not a permanent object of thought, but a flesh that suffers when it is wounded, hands that touch?

--Maurice Merleau-Ponty

With whisper[s] we send the body out into networked space, funneling the body through one or more of its physiological data sources. Is this not similar to what Deleuze sees in Francis Bacon's painting when, in The Logic of Sensation (2004), he describes the mouth as the organ through which the body escapes? The mouth "is no longer a particular organ, but the hole through which the entire body escapes and from which the flesh descends." Are we letting the body escape from itself through one of its organs, leaving ourselves with nothing but "the immense pity that the meat evokes"? (Deleuze 2004, 26).

This seemingly abrupt shift of tone from quiet optimism, or even utopianism, to intimations of the abject is required to complete the journey of closeness, and to truly embed Merleau-Ponty's understanding of reversibility in contemporary technologized bodies. As indicated above, there is no question of the whisper[s] wearables mimicking or simulating affect: these expansions of corporeality operate like a Bacon painting according to a fidelity to materiality, or at least to meat. "[T]he body must return to the material structure and dissipate into it, thereby passing through or into these prostheses-instruments, which constitute passages and states that are real, physical, and effective, and which are sensations and not imaginings" (ibid., 18–19). Wearables will always bump into the abject by virtue of their seeming like prostheses, even if beautiful or seductive prostheses. And of course there is the question of pain, discussed previously in the chapter on motion capture, but here it is relevant again in the acrobatics of immanent states performed by the whisper[s] devices: "meat is not dead flesh, it retains all the sufferings and assumes all the colors of living flesh. It manifests such convulsive pain and vulnerability, but also such delightful invention, color, and acrobatics" (ibid., 23). It is important to retain the full sensory range of flesh, important not to fall into old philosophical habits of abstraction, and one way of doing this is to recognize the inextricability of flesh from pain. Donna Haraway, despite confronting and overcoming abjection by celebrating the merging of bodies with machines in her cyborg manifesto, never loses sight of pain. She allows for the conceptual status of flesh by indicating that it is "no more a thing than a gene is," but insists that flesh "always includes the tones of intimacy, of body, of bleeding, of suffering, of juiciness…one cannot use the word flesh without understanding vulnerability and pain" (Haraway 2000, 86). Flesh, she writes, is "always somehow wet," evoking the viscosity of the abject body vividly tattooed on the cultural imaginary by Julia Kristeva's Powers of Horror (1982).

Is it cynical to locate artistic and research projects in the vulnerable areas of human intimacy, physiological functioning, and expression of deep affect? Intimacy is linked with vulnerability, and pain is only a heartbeat behind. Wearables are extraordinary, because once the initial euphoria or fethishization exhausts itself, several competing notions of abjection jostle with each other. There is the classical abject of literature and cinema as manifested by cyborgs and robots, by Mary Shelley's Frankenstein and the notion of a body that is no longer pure or purely human by virtue of being monstrous (Shelley 1993; Balsamo 1999; Orlan 2004). There is the abject of artists, philosophers, and literary theorists from the 1980s and 1990s of bodily fluids such as piss, shit, vomit, and decay, and liminal states of hallucination and annihilation that exist outside language, at the borders of discursive and visual representation (Kristeva 1982; Irigaray, 1985; Butler, 1993; Lyotard 1993).20 There is the political equivalent of the abject that encompasses those who challenge the smooth functioning of society, such as the homeless, ill, disabled, criminal, or insane (Foucault 1995, 2003). None of these versions of the abject are proposed here for wearables, although these devices and systems are proximate with the first. A new potential for abjection woven into the fabric of wearables was captured by art historian Susan Ryan when she asked "Do wearable technologies offer us new opportunities or are they just corporate branding in drag?" (Ryan 2004). Is this the abject as it pertains to wearables--consumerism, surveillance, control? Nigel Thrift illustrates in very clear terms how "affect has become part of a reflexive loop which allows more and more sophisticated interventions in various registers of urban life." Systematic knowledge pertaining to the manipulate affect are deployed knowingly and with political intent, and we construe affect as warm and cuddly at our peril: its uses can be "downright scary" (Thrift 2003, 58). We are a generation of Frankensteins, and the convergence of the corporeal with the machinic no longer frightens us. The abject is now more subtle. It has become affective and relates to the digital hole through which the body escapes and what happens to it once it has undergone its transubstantiations.

The abject lies there… "quite close," and its proximity to whisper[s] can be revealed by relating several stories of how the project "beseeches, worries, and fascinates desire" (Kristeva 1982, 1). The most general fears expressed by people participating in the installations related to whether their body data would be held somewhere, enabling faceless entities, like banks, insurance companies, security agencies, or even telemarketers, to recognize them. The whisper[s] devices sense and transmit data, but as of now they do not record physiological data. This would be to cross a significant threshold. The notion of recording personal data left people with a fear of where it might end up, who might access it, and what it might reveal. There were worries over how it might be used, or abused, and the social and corporeal implications of this. The abject became the potential for corporealities to be located and identified by corporations, for physical bodies to be subsumed by corporate bodies or an extended military corpus. Even further, it became the prospect of their bodies being deformed, misappropriated, or misrepresented in databases and, like identity theft, coming back to haunt them in social and political reality. "Like an inescapable boomerang," Kristeva writes, the one haunted by the abject is placed "literally beside himself" (Kristeva 1982, 1). A discursive fracas at a workshop on physiological computing associated with a SIGCHI (Special Interest Group in Computer Human Interaction) conference confronted this question of the ownership of, and access to, body data from a different perspective.21 After Thecla Schiphorst and I completed our presentation of the whisper[s] project we were met with silence on the part of some of the medical researchers in the room. Echoing the "How dare you?" question discussed in chapter 2 pertaining to the choice of a dancer to speak for herself, a similar "How dare you?" was posed, implying that we were inexcusably irresponsible for letting people have access to information about the functioning of their own heart and lungs. This knowledge was perceived to be the domain of medical professionals and we were warned in no uncertain terms that people might fear for their lives if presented with information on their own bodies. The physiological data was effectively framed as abject, and as such it needed to be "radically excluded" from the knowledge of the very person from whom it was drawn. The exposure of the person to her data could only enhance her fragility and draw her to a place where meaning collapses and her body, somehow, becomes a breath or two closer to being a corpse (Kristeva 1982, 2–3). Of course it was easy for Schiphorst and me to respond to this provocation from feminist and Foucauldian positions concerning the right to access and own the means of controlling our bodies, but this rebuttal sidestepped the presence of the abject at the center of this debate. It was less interesting to refute the position than to recognize the fears upon which it was based. The seeming paternalism of the medical professionals was actually reinforced by a young woman who echoed the sentiment when she explained her refusal to participate in the project on the grounds that she "wanted to have a baby one day" and did not want any unpleasant surprises. She did not want access to her physiological data, even artistic extrapolations of it. Mortality loomed once again, as did pain and vulnerability.

Key system design decisions for the transfer of data through the wearables platform remain contentious and unsettled among the whisper[s] artists, and equally contentious among the public who participate in the installations. Seemingly trivial, these decisions relate to whether the system is designed for a person to give or to receive data. If I desire to give you my data I initiate this action by choosing you and deciding to give you my breath, or heart, or a combination of the two. The reverse can also be programmed into the system. I may decide to receive data from you, to approach you and listen to your body; but this action, which can be construed as my adopting a generous state of receptivity to your corporeality, can also be the equivalent of my taking your data--walking up to you and extracting it. Many participants in the installations were uneasy over the thought that someone could approach them and take their body from them. Once again, Deleuze's interpretation of Bacon's paintings as depicting the body escaping through the "hole" of one of its organs is disturbingly appropriate: participants were afraid that their body might be taken from them, as if another could come up to them and puncture a hole in their skin and extract their breath or heart. Generosity becomes abject cruelty. Or simply abjection.

The whisper[s] project, and many computational systems dealing with physiological data or flesh, reveal that beauty and abjection are, in the words of Merleau-Ponty, the obverse and the reverse of one another. The act of offering one's body data in a state of openness combines the activity of giving with the passivity of having something taken. This echoes the famous seeing-seen reversible dynamic according to which I am both subject and object, but the application of this to physiological data to the immanent states of the body adds an edge of abjection to the dynamic. The stakes are higher, and messier. The potential for risk is no longer simply being seen alongside objects, but also of having your affective or physiological states viewed, controlled, disseminated, or extracted. As indicated above, the intensification brought to the reversible dynamic by wearable computing is significant to complete the journey of this Merleau-Pontian-inspired approach to bodies and technologies. The abject is close to the body. It is no more or less close to bodies that converge with technologies, but perhaps it is harder to overlook. Saying that the abject converges with the beautiful according to the familiar dynamic of reversibility is important for two reasons: it offers a more subtle yet pervasive sense of abjection, and it addresses the concern that Merleau-Ponty is simply a philosopher of the beautiful. His luxuriant prose, his celebration of the loss of self in the beauty of a landscape, in a pool surrounded by cypresses, or in an enchanted state of floating in the world with another body make some critics worry that his thought cannot take into account the less pleasant realities of contemporary life, or account, quite simply for the disruption provided by otherness.22 In previous chapters I have demonstrated the tensions, disequilibrium, and absence inherent to his dynamic understanding of the body in the world, but here the concern is simply with revealing that the relation between the abject and the beautiful can also be construed according to the dynamic of reversibility. Researching, designing, and participating in the social choreographies offered by the whisper[s] project revealed this.

The subtlety of the abject is that it is not simply a state of quasi-horror and destitution. As Kristeva writes, desire and intense pleasure (jouissance) also reside in abjection. The vitality of abjection was conveyed wonderfully by a phenomenological observation from someone exposed to the whisper[s] project for the first time. A woman in the final stages of sex reassignment therapy, from a man's body to a woman's, indicated that the information she most wanted to sense and transmit to her loved ones was the fluctuating and transforming state of her hormones. She asked if such a sensor could be built into the whisper[s] platform, a hormonal sensor, but also a monitor of the wavering state of her liminality between male and female. She provided a corporeal ground for Kristeva's location of the abject on "the edge of non-existence and hallucination, of a reality that, if I acknowledge it, annihilates me. There, abject and abjection are my safeguards" (Kristeva 1982, 2). If the whisper[s] devices could be seen to be sensors and transmitters of the abject, they could become this woman's safeguards, assurance that her new reality was not disappearing or becoming entirely virtual and ungrounded in flesh.

The Abject: "Quite Close"

19. I accept that Spinoza's ethics, as indicated by Genevieve Lloyd, "has shown an extraordinary capacity to admit diametrically opposed readings" and am aware that this chapter offers just a brush with Spinoza's understanding of affect. This is the direction of a future project in performance and mobile technologies through which many of these ideas will be presented as more than what Deleuze refers to as sudden illuminations from Spinoza, like flashes, which are what this chapter contains (Deleuze 1988; Lloyd 2004).

20. Artists Cindy Sherman, Andres Serrano, and Matthew Barney are known for producing abject work dealing with gender, sexuality, and perversion in the 1980s and 1990s.

21. Once more, as with note 12 above, I am not able to attribute the comments due to the protected nature of these conversations.

22. Recall Irigaray's critique of Merleau-Ponty as offering a luxuriant solipsism, discussed in chapter 3. In previous writing I constructed a critique of Merleau-Ponty as a philosopher of the beautiful and attempted to extrapolate elements of his thought that pointed to a notion of the sublime in order to account for dance (Kozel 1994). With this book my position is somewhat revised. I see more light and dark in his writing and shift my focus to the abject body rather than the more elaborate notion of the sublime.