Disembodied Telepresence and the
Remoteness of the Real

Three

She could see the image of her son, who lived on the other side of
the earth, and he could see her. . . . 'What is it, dearest boy?' . . . 'I
want you to come and see me.' 'But I can see you!' she exclaimed.
'What more do you want?' . . . 'I see something like you . . . but I do
not see you. I hear something like you through this phone, but I
do not hear you.' The imponderable bloom, declared by discredited
philosophy to be the actual essence of intercourse, was ignored by
the machine.

E. M. Forster, 'The Machine Stops'[1]

Artists see far ahead of their time. Thus, just after the turn of
the last century, E. M. Forster envisioned and deplored an age
in which people would be able to sit in their rooms all their
lives, keeping in touch with the world electronically. Now we
have almost arrived at this stage of our culture. We can keep
up on the latest events in the universe, shop, do research,
communicate with our family, friends, and colleagues, meet
new people, play games, and control remote robots all
without leaving our rooms. When we are engaged in such
activities, our bodies seem irrelevant and our minds seem
to be present wherever our interest takes us.[2]

As we have seen, some enthusiasts rejoice that, thanks to
progress in achieving such telepresence, we are on the way to
sloughing off our situated bodies and becoming ubiquitous
and, ultimately, immortal. Others worry that if we stay in
our rooms and only relate to the world and other people

through the Net we will become isolated and depressed, as
the Carnegie-Mellon study mentioned in the Introduction
seems to confirm.

A more recent and more extensive study at Stanford
University confirmed the isolation but did not take up the
question of the loneliness and depression. *The New York Times*
reports:

In contrast to the Carnegie-Mellon study, which focused on
psychological and emotional issues, the Stanford survey is an
effort to provide a broad demographic picture of Internet use
and its potential impact on society. . . . Mr. Nie [the survey
director] asserted that the Internet was creating a broad new
wave of social isolation in the United States, raising the
specter of an atomized world without human contact or
emotion.[3]

The Stanford researchers, like the sponsors of the Carnegie-
Mellon survey, were surprised by their findings. They lament
that no one is trying to look ahead to what, if anything, we
will lose if we limit ourselves to disembodied interactions.
' "No one is asking the obvious questions about what kind of
world we are going to live in when the Internet becomes
ubiquitous", Mr. Nie said.'[4] Since that is precisely what we are
trying to do here, we had better get on with our work.

Lovers of the Internet claim that we will soon be able to live
our lives through a vast Network that will become more and
more dense like a tissue or like an invisible ocean in which we
will swim. They see this as a great opportunity. *Wired Magazine*
tells us:

Today's metaphor is the network – a vast expanse of nodes
strung together with dark, gaping holes in between. But as

the threads inevitably become more tightly drawn, the mesh will fill out into a fabric, and then – with no voids whatsoever – into an all-pervasive presence, both powerful and unremarkable. ... In the words of Eric Brewer, a specialist on computer security and parallel computing, it will be 'a giant, largely invisible infrastructure that makes your life better.'[5]

Given that many people now agree that, as things are going, we will soon live our lives through such a vast, invisible, interconnected infrastructure, we must surely ask: will it, indeed, make our lives better? What would be gained and what, if anything, would be lost if we were to take leave of our situated bodies in exchange for ubiquitous telepresence in cyberspace? We can break up this question into two: how does relating to the world through teletechnology affect our overall sense of reality? And what, if anything, is lost when human beings relate to each other by way of teletechnology? To answer these questions, we will first have to explore the more general question: what is telepresence and how is it related to our everyday experience of being in the presence of things and people?

In modernity, we tend to ask how can we ever get out of our inner, private, subjective experience so as to be in the presence of the things and people in the external world? While this seems an important question to us now, it was not always taken seriously. The Greeks thought of human beings as empty heads turned towards the world. St Augustine worked hard to convince people that they had an inner life. In his *Confessions* he goes out of his way to comment on the amazing fact that St Ambrose could read to himself. 'When he read, his eyes scanned the page and his heart explored the

meaning, but his voice was silent and his tongue was still.'[6] But the idea that there was an inner world didn't really take hold until early in the seventeenth century when three influences led René Descartes to make the modern distinction between the contents of the mind and the rest of reality.

To begin with, instruments like the telescope and microscope were extending man's perceptual powers, but along with such indirect access came doubts about the reliability of what one seemed to see by means of such prostheses. The church doubted Galileo's report of spots on the sun and, as Ian Hacking tells us, 'even into the 1860s there were serious debates as to whether globules seen through a microscope were artifacts of the instrument or genuine elements of living material (they were artifacts)'.[7]

At the same time, the sense organs themselves were being understood as transducers bringing information to the brain. Descartes pioneered this research with an account of how the eye responded to light and passed the information on to the brain by means of 'the small fibers of the optic nerve'.[8] Likewise, Descartes understood that other nerves brought information about the body to the brain and from there to the mind. Descartes thought that this showed that our access to the world is indirect, that is, that things are never directly present to us.

He then went even further and used reports of people with a phantom limb to call into question our seemingly direct experience that we have bodies:

I have been assured by men whose arm or leg has been amputated that it still seemed to them that they occasionally felt pain in the limb they had lost—thus giving me grounds to think that I could not be quite certain that a pain I

endured was indeed due to the limb in which I seemed to feel it.[9]

So Descartes concluded that we are never present to the world or even to our own bodies but that all that we can directly experience is the content of our own minds. And, indeed, when we engage in philosophical reflection, it seems we have to agree with Descartes. It seems to us that we do not have direct access to the external world but only to our private, subjective experiences.

If this were our true condition, then the mediated information concerning distant objects and people transmitted to us over the Internet as telepresence would be as present as anything could get. But, in response to the Cartesian claim that all our experience of the world is indirect, pragmatists such as William James and John Dewey emphasized that the crucial question is whether our relation to the world is that of a disembodied detached spectator or an involved embodied agent. On their analysis, what gives us our sense of being in direct touch with reality is that we can control events in the world and get perceptual feedback concerning what we have done.

But even this sort of control and feedback is not sufficient to give the controller a sense of direct contact with reality. As long as we are controlling a robot with delayed feedback, such as Ken Goldberg's Telegarden arm[10] or the Mars Sojourner, what we see on the screen will seem to be mediated by our long-distance equipment, and therefore not truly tele-*present*.

There comes a point in interactive robot control, however, where we are able to cope skilfully with things and people in real time. Then, as in laparoscopic-surgery, for example, the

doctor feels himself present at the robot site, the way blind people feel themselves present at the end of their cane. But even though interactive control and feedback may give us a sense of being directly in touch with the objects we manipulate, it may still leave us with a vague sense that we are not in touch with reality. Something about the distance still undermines our sense of direct presence.

One might think that what is missing from our experience as we sit safely at home remotely controlling our car, for example, is a constant readiness for risky surprises. To avoid extremely risky situations is precisely why remotely-controlled planet-exploring vehicles and tools for handling radioactive substances were developed in the first place; but, in the everyday world, our bodies are always in potentially risky situations. So, when we are in the real world, not just as minds but as embodied vulnerable human beings, we must constantly be ready for dangerous surprises. Perhaps, when this sense of vulnerability is absent, our whole experience is sensed as unreal, even if, involved in a sort of super-Imax interactive display, we are swaying back and forth as our car careens around dangerous-looking curves. But aren't believers in the triumph of technology such as the Extropians right on this point? Couldn't we develop a technologically-controlled world so tame that being on our guard all the time was no longer necessary? And wouldn't it still seem real?

Maurice Merleau-Ponty has attempted to answer this question, and refute Descartes, by describing just what gives us our sense of the world being directly present to us. He holds that there is a more basic kind of need than the need for safety – a need we can never banish as long as we have bodies. It is the need to get what Merleau-Ponty calls an optimal grip on the world. Merleau-Ponty points out that, when we

are looking at something, we tend, without thinking about it, to find the best distance for taking in both the thing as a whole and its different parts. When grasping something, we tend to grab it in such a way as to get the best grip on it. Merleau-Ponty says:

> For each object, as for each picture in an art gallery, there is an optimum distance from which it requires to be seen: . . . at a shorter or greater distance we have a perception blurred through excess or deficiency. We therefore tend towards the maximum of visibility, and seek a better focus as with a microscope.[11]

According to Merleau-Ponty, it is the body that seeks this optimum:

> My body is geared into the world when my perception presents me with a spectacle as varied and as clearly articulated as possible, and when my motor intentions, as they unfold, receive the responses they expect from the world. This maximum sharpness of perception and action points clearly to a perceptual *ground*, a basis of my life, a general setting in which my body can co-exist with the world.[12]

So, perception is motivated by the indeterminacy of experience and our perceptual skills serve to make determinable objects sufficiently determinate for us to get an optimal grip on them. Moreover, we wouldn't want to evolve beyond the tendency of our bodies to move so as to get a grip on the world since this tendency is what leads us to organize our experience into the experience of stable objects in the first place. Without our constant sense of the uncertainty and instability of our world and our constant moving to overcome it, we would have no stable world at all.[13]

Not only is each of us an active body coping with things, but, as embodied, we each experience a constant readiness to cope with things in general that goes beyond our readiness to cope with any specific thing. Merleau-Ponty calls this embodied readiness our Urdoxa[14] or 'primordial belief' in the reality of the world. It is what gives us our sense of the direct presence of things. So, for there to be a sense of presence in telepresence, one would not only have to be able to get a grip on things at a distance; one would need to have a sense of the context as soliciting a constant readiness to get a grip on whatever comes along.

This sense of being embedded in a world with which we are set to cope is easiest to see if we contrast our experience of the direct presence of other people with telepresence such as teleconferencing. Researchers developing devices for providing telepresence hope to achieve a greater and greater sense of actually being in the presence of distant people and events by introducing high-resolution television and surround sound, and by adding touch and smell channels. Scientists agree that 'full telepresence requires a transparent display system, high resolution image and wide field of view, a multiplicity of feedback channels (visual as well as aural and tactile information, and even environmental data such as moisture level and air temperature), and a consistency of information between these'.[15] They assume that the more such multi-channel, real-time, interactive coupling teletechnology gives us, the more we will have a sense of the full presence of distant objects and people.

But even such a multi-channel approach may not be sufficient. Two roboticists at Berkeley, John Canny and Eric Paulos, criticize the attempt to break down human–human interaction into a set of context-independent communication

channels such as video, audio, haptics, etc. They point out that two human beings conversing face to face depend on a subtle combination of eye movements, head motion, gesture, and posture and so interact in a much richer way than most roboticists realize.[16] Their studies suggest that a holistic sense of embodied interaction may well be crucial to everyday human encounters, and that this intercorporeality, as Merleau-Ponty calls it, cannot be captured by adding together 3D images, stereo sound, remote robot control, and so forth.

Just what is missing can best be seen if we return to the question of distance learning. We ended the last chapter by asking whether the presence of the teacher required for full-fledged learning could be captured by telepresence. We are now in a position to suggest an answer to this question. But, rather than looking at the six stages of skill acquisition from the point of view of the learner, we will look at learning from the point of view of the teacher and ask, what, if anything, does the teacher lose in attempting to teach skills at a distance?

If the teacher is only recording videotape, then there is no telepresence at all, and a great deal is surely lost. For example, if risk is important in the learning process, then when the teacher and the class are present together both assume a risk that is not there when they are not inter-acting – the student risks being called on to demonstrate his knowledge of the subject of the lecture, and the teacher risks being asked a question he cannot answer. If this is the case, then it may mean that distance teaching not only may pro-duce poorer learning opportunities, but it may produce poorer teachers.

It's true that we think of teachers teaching students, but it is also the case that in an interactive classroom environment the students teach the teacher. The teacher learns that certain examples do or do not work, that some material has to be presented differently from others, that he was simply wrong about some fact or theory, or even that there was a better way of looking at the whole question. It's been said that a 'good university' is one that has teachers and learners, but that a 'great university' has only learners. If so, passive distance edu-cation, by removing the risk in learning and teaching, deprives students and teachers of what is most important, namely, learning how to learn.

The challenging case is live, interactive, video distance learning, although this is not the use of the Web that adminis-trators find cost-effective and therefore attractive. Still, it is the sort of technology that could produce telepresence if anything can. David Blair has given a great deal of thought to his experience both in the presence of students in the class-room and in interactive teleteaching. Here are some of his observations.

> In the first place I am often aware of a lot of things going on in the class in addition to a student actually asking a question or commenting. Sometimes when a student asks a question I can see, peripherally, other students nodding their heads in agreement with the question. This would indicate that the student's question is important to the rest of the class so I will take more care in answering it fully. At the other end of the attention spectrum, I can often see, again, peripherally, when students are bored or sleeping or chatting amongst themselves. This means I may have to pick up the pace of the lecture and try to regain their attention. In teaching students at a distance, I can't control where the camera points and what it zooms in on, the way I control

what attracts my experienced attention when the class is in front of me.

Second, as I lecture, I'm drawn to the point of view that is most comfortable or informative for me – a point of view that may be different from lecture to lecture and even may change during a lecture. Perhaps this is similar to Merleau-Ponty's notion of 'maximum grip'. To find this point of view requires that I be able to move around during the lecture sometimes approaching the students closely, sometimes moving away.

Finally, much of my sense of the immediate presence of the students in a class comes from my ability to make eye contact with them. My experience with the CU-CMe ('see-you-see-me') technology on computers is that you cannot make eye contact over a visual channel, no matter how good the transmission is. To look into another person's eyes, I would have to look straight into the camera but then I would not be able to see the eyes of the other person since, to do that, I would have to turn from the camera to the student's image on the screen. You can look into the camera or look at the screen, but you can't do both.[17]

What is lost, then, in telepresence is the possibility of my controlling my body's movement so as to get a better grip on the world.

What is also lost, even in interactive video, is a sense of the context. In teaching, the context is the mood in the room. In general, mood governs how people make sense of what they are experiencing. Our body is what enables us to be attuned to the mood. Ask yourself, if you were a telespectator at a party, would you be able to share the mood? Whereas, as Heidegger points out, if you are present at a party, it is hard to resist sharing the elation or depression of the occasion.[18] Likewise,

there is always some shared mood in the classroom and it determines what matters – what is experienced as exciting or boring, salient or marginal, relevant or irrelevant. The right mood keeps students involved by giving them a sense of what is important.

Like a good teacher, Blair is sensitive to the mood in his classroom. He writes:

As I became more experienced lecturing, I began to have a sense of the class as not just a collection of students but as a whole – as a single entity. I feel that the class as a whole is attentive, or responsive, or not responsive, or friendly, or skeptical, etc. This feeling is not just the sum of certain students who appear this way, but is a kind of general feeling. I can get this feeling without a sense of any individual students exemplifying these characteristics. I don't think that any telecommunications device could enable me to get that feeling when viewing the audience at a distance.

One can, perhaps, get a sense of the importance of the sort of subtle interactions that Blair so aptly describes by considering the fact that people pay around $60 a seat to go to a play, even though they can see a movie for a fifth as much. This obviously has something to do with being in the presence of the actors. Presumably, the actors, like good lecturers, are, at every moment, subtly and largely unconsciously adjusting to the responses of the audience and thereby controlling and intensifying the mood in the theatre. Thus, the co-presence of audience and performer provides the audience with the possibility of direct interaction with the performer, and it seems clear that it is this communication going on between the performers and the audience that brings the show to life. Also the spectator in the theatre can

choose whom to zoom in on, while in a film that choice is made by the director. Thus, the theatre spectator is actively involved in what happens in front of him, and this contributes to his sense of being present in the same world as the actors.

This way of looking at the importance of bodily presence raises a new question. Films and CDs are different from plays and concerts but each, in its own way, seems just as gripping as its embodied counterpart. Clearly, some stage actors can learn to act in movies, and some live performers can succeed as studio musicians able to produce an intense effect without any feedback from an audience. It should be possible, then, for a lecturer to use the feedback from the cameras and microphones that show remote students, to involve those students in the lecture, without his needing to manage the mood in the remote rooms. This possibility can't be excluded a priori. We will just have to wait and see if distance education breeds a new brand of teleteachers — teacher-movie-actors who are as effective as the current teacher-live-performers.

Still, if we follow the movie/play comparison to the end, the idea that the teleteacher could equal the powerful effect of a skilled teacher who is present in the same room with her students seems unlikely. Without the sense of the mood in the room as well as the shared risk, the involvement of the students with a movie-actor teacher will almost surely be less intense than that of students and teachers reacting to each other's presence. So, it seems that, given the skill model I proposed at the beginning of this chapter, in the domain of education at least, each technological advance that makes teaching more economical and more flexible, by making the teacher and student less immediately present to each other, makes the teaching less effective. One would expect to see a

decline in involvement and effectiveness, from tutorial teaching to classroom teaching, to large lecture halls, to interactive video, to asynchronous Net-based courses.

Given this trade-off of economy and efficacy, it looks like we might well end up with a two-tiered educational system where those who can afford it will pay five times as much as the distance learning students pay, in order to be in the presence of their professors. This would amount to an elitism not much different from the English elitism of Oxford and Cambridge vis-à-vis the other universities that don't have tutorials — the very elitism that, according to Hundt, the democratic levelling produced by distance learning is supposed to eliminate.

The inferiority of distance learning at the college level seems clear, but what about the vocational and postgraduate teaching which is thought to be the forte of the Internet? One study of the advantages of continuous education on the Internet typifies the jargon and the misplaced optimism characteristic of the field.

> Distributed education encompasses distance education but reaches further to imagine a global disaggregation of instructional resources into modular components of excellence which can be reassembled by any organization in the 'business' of certifying quality-assured learning accomplishment (certificates and degrees). The result should be a conveniently and affordably accessible, enriched educational environment that integrates the networked delivery of learningware and asynchronous and synchronous conversations within learning communities of student apprentices, their expert mentors, and their educational and career advisors.[19]

Such claims completely miss the point of mentoring and apprenticeship. As we have already seen, the role of the master is to pass on to the apprentice the ability to apply the theory of some domain in the real world. But, one might well ask, why not just record the master at work and transmit his image to his teleapprentices? For example, why not just put a camera on the head of a doctor teaching interns on his rounds and wire him with a microphone so that the teleinterns can see and hear just what the doctor and the interns who are present see and hear?

What, if anything, would the teleinterns miss? The answer again is immersion in the context. A camera fixed to the doctor's forehead would, indeed, look wherever he focused his attention, so the teleinterns might well see even better than those actually present in the hospital what the doctor was currently seeing. But the problem is that it is the doctor's responsiveness to the whole situation that determines which details he pays attention to and zooms in on. The camera on the doctor's head would, thus, show distant students exactly what feature of the patient's condition the doctor was seeing, but not the background that led that feature to stand out for the doctor so that he zoomed in on it. The teleintern would surely learn something from a televised image of what the doctor pays attention to, but he or she would always remain a prisoner of the doctor's attention setting, just as in a tele-lecture the professor is a prisoner of the camera operator and the sound engineer in the distant lecture hall. Yet the ability to zoom in on what is significant is one of the most important skills the intern diagnostician has to learn.

So why not also have a camera and microphone that record and transmit the whole ambient hospital scene? The distance-intern could then watch, on a split screen, both the background and what the doctor focuses attention on, and so learn to notice those features of the overall scene that solicit the doctor's attention.

Here, as in the lecture-hall case, the devil is in the phenomenological details. For the doctor who is actually involved in the situation, it's not as if he had two views – one, a wide-angle view of the uninterpreted situation, and the other, a close-up of the details he is focused on. In becoming a diagnostic master, the doctor has learned to see an already-interpreted situation where certain features and aspects spontaneously stand out as meaningful, just as, as one becomes familiar with a strange city, it ceases to look like a jumble of buildings and streets and develops what Merleau-Ponty calls a familiar physiognomy. The intern is trying, among other things, precisely to acquire the doctor's physiognomic perceptual understanding.

So why, if the intern sees the correlation between the uninterpreted scene on half the screen and the relevant features on the other, couldn't he acquire the doctor's physiognomic understanding? Precisely because the technology deprives the learner of bodily involvement in a risky real environment where he has to interpret the scene himself and learn from his mistakes. Merleau-Ponty would argue that, if one does not have the experience of zooming in on the details that, on the basis of previous experience, come to elicit one's attention, and then discovering the hard way when one is right and when one is mistaken as to the relevant details, one will not find that the scene becomes more and more full of meaning. Thus, the distance-apprentice will not learn to respond to the overall scene by being drawn to zoom in on what is significant. But this is precisely what the intern must learn if he is to become an expert diagnostician.

In the real learning situation, where the patient, the doctor, and the interns are directly present, the apprentice doctors can shift their attention to new details they take to be significant and then find out whether they were right or missed something important. If they are thus involved, then, with every success and failure, the overall organization of their background changes, so that in future encounters a different aspect will stand out as significant. There is thus a constantly enriched interaction between the details and the overall significance of the situation. Merleau-Ponty calls this kind of feedback between one's actions and the perceptual world, the intentional arc.[20] And he points out that it functions only if the perceiver is using his body as an 'I can', that is, in this case, if he controls where he looks.

So, to learn to see what the doctor sees, the tele-intern must be able to control the direction each camera points and how much each camera zooms in or out. After all, simply by having a great deal of passive experience, by watching football games on TV, for example, one can become competent at following the ball and even predicting and interpreting the plays. So one might well think that adding control of where one looked would enable the tele-student to acquire an expert feel for any skill domain. In such an ideal distance-learning setup, would anything required for learning be left out?

As we saw in Chapter 2, the learner becomes an expert by reacting to specific situations, and taking to heart the results. On the basis of sufficient such experience, the brain of the beginner gradually comes to connect perception and action so that, in a situation similar to one that has already been experienced, the agent immediately makes a response similar to the response that worked the last time the learner was in

that type of situation. But this requires that the learning situations in which one acquires a skill be sufficiently similar to actual situations so that the responses one learns in training carry over to the real world.

So, any form of telelearning, whether interactive or not, must face a final challenge. Can telepresence reproduce the sense of being in the situation so that what is learned transfers to the real world? Experienced teachers and phenomenologists agree that the answer is 'no'. To see in a stark and extreme form the sort of embodied presence any attempt to transmit full presence cannot capture, it helps to take an example from a physical sport like football.

Barry Lamb, Safeties Coach for the Brigham Young University Football Team and a former All-American linebacker and defensive end at Santa Barbara CC (1973–74), reports the following:

> Our players can learn a great deal by watching films, but only to a point. It's hard to say exactly what it is that you can't learn by watching film, but a good player learns to sense the overall situation and to do things instinctively that just don't make sense if you're only looking at what you can see on film. Most game film, of course, is not taken from a player's perspective. But even if you could correct for that, the depth of field is never the same on film as it is in real life.[21] That means that you can't really learn to see the playing field in the right way, or get a feel for the tempo of the game. In addition, there is more to learning how to see a play develop than just having your head or eyes pointed in the right direction. Our players need to learn how to use their peripheral vision to get a feel for what is going on around them, and what your peripheral vision tells you makes you see what is going on in front of you

differently.[22] Moreover, the emotions of the game change how a player sees the field, and those aren't things that one can get a feel for from the film.

Another way to see how the film is too sterile to teach everything our players need to learn is by noticing that opposing players aren't threatening on film in the same way that they are in real life. The fact that there are eleven players in front of you who want to hurt you really makes you see and understand things differently.

In sum, learning to do the right thing, a thing that sometimes doesn't make sense, is something that can only happen when a person experiences a present situation over and over again, whether in practice or in real life.[23]

All this suggests that distance-learners looking at a surround screen and hearing stereo sound would be able to develop a degree of competence. Thus, an intern could become competent at recognizing and, perhaps, even anticipating many of the symptoms the doctor has pointed out, just as an avid TV viewer can learn to recognize and anticipate many of the plays on the footfall field. Furthermore, if the learner could view the scene transmitted by cameras placed exactly where the actual embodied learner would normally be placed, he might even be able to become proficient. But such distance-learners would still lack the experience that comes from responding directly to the risky and perceptually rich situations that the world presents. Without an experience of their embodied successes and failures in actual situations, such learners would not be able to acquire the ability of an expert who responds immediately to present situations in a masterful way. So we must conclude that expertise cannot be acquired in disembodied cyberspace. Distance-learning enthusiasts notwithstanding, apprentice-

ship can only take place in the shared situations of the home, the hospital, the playing field, the laboratory, and the production sites of crafts. Distance-apprenticeship is an oxymoron.

Once we see that there is a way of being directly present to things and people that is denied by Descartes and all of modern philosophy, we see that there may well be basic limitations on telepresence that go far beyond the problems of distance teaching. Where the presence of people rather than objects is concerned, we sense a crucial difference between those we have access to through our distance senses of hearing, sight, etc. and the full-bodied presence that is literally within arm's reach. This full-bodied presence is more than the feeling that I am present at the site of a robot arm I am controlling from a distance through real-time interaction. Nor is it just a question of giving robots surface sensors so that, through them as prostheses, we can touch other people at a distance. Even the most gentle person–robot interaction would never be a caress, nor could one successfully use a delicately controlled and touch-sensitive robot arm to give one's kid a hug. Whatever hugs do for people, I'm quite sure telehugs won't do it. And any act of intimacy mediated by any sort of robot prosthesis would surely be equally grotesque, if not obscene. Even if our teletechnology goes beyond the imagination of E. M. Forster so that eventually we can use remote-controlled robotic arms and hands to touch other people, I doubt that people could get a sense of how much to trust each other even if they could stare into each other's eyes on their respective screens, while, at the same time, using their robot arms to shake each other's robotic hands.

Perhaps, one day, we will stop missing this kind of bodily contact, and touching another person will be considered rude

or disgusting. E. M. Forster envisions such a future in his story:

> When Vashti swerved away from the sunbeams with a cry [the
> flight attendant] behaved barbarically – she put out her hand
> to steady her. 'How dare you!' exclaimed the passenger, 'you
> forget yourself!' The woman was confused, and apologized for
> not having let her fall. People never touched one another. The
> custom had become obsolete, owing to the Machine.[24]

For the time being, however, investment bankers know that in order to get two CEOs to trust one another enough to merge their companies, it is not sufficient that they have many teleconferences. They must live together for several days interacting in a shared environment, and it is quite likely that they will finally make their deal over dinner.[25]

Of course, there are many kinds of trust, and the trust that we have that our mail carrier will deliver our mail does not require looking her in the eye or shaking her hand. The kind of trust that requires such body contact is our trust that some-one will act sympathetically to our interests even when so doing might go against his or her own.[26]

What is the connection between such trust and embodied presence? Perhaps our sense of trust must draw on the sense of security and well-being each of us presumably experienced as babies in our caretaker's arms.[27] Our sense of reality, then, would not be just the readiness for flight of a hunted animal; it could also be the feeling of joy and security of being cared for. If so, even the most sophisticated forms of telepresence may well seem remote and even obscene if not in some way connected with our sense of the warm, encircling, nearness of a flesh-and-blood human body.

Furthermore, it seems that to trust someone you have to make yourself vulnerable to him or her and they have to be vulnerable to you. Part of trust is based on the experience that the other does not take advantage of one's vulnerability. I have to be in the same room with someone and know they could physically hurt me or publicly humiliate me and observe that they do not do so, in order to feel I can trust them and make myself vulnerable to them in other ways.

There is no doubt that telepresence can provide some sense of trust, but it seems to be a much-attenuated sense. Perhaps in the future world of the Internet we will none the less come to prefer telepresence to total isolation, like Harlow's monkeys who, lacking a real mother, shun the wire 'mother' and cling desperately to the terry-cloth one – never knowing the comfort and security of a real mother's arms.[28]

Not that we automatically trust anyone who hugs us. Far from it. Just as for Merleau-Ponty it is only on the background of our embodied faith in the presence and reality of the per-ceptual world that we can doubt the reality of any specific perceptual experience, so we seem to have a background pre-disposition to trust those who touch us tenderly, and it is only on the basis of this Urtrust that we can be mistrustful in any specific case. If that background trust were missing, as it would necessarily be in cyberspace, we might tend to be suspicious of the trustworthiness of every social interaction and withhold our trust until we could confirm its justifica-tion. Such a scepticism would complicate if not poison all human interaction.

CONCLUSION

We have now seen that our sense of the reality of things and people and our ability to interact effectively with them depend on the way our body works silently in the

background. Its ability to get a grip on things provides our sense of the reality of what we are doing and are ready to do; this, in turn, gives us a sense both of our power and of our vulnerability to the risky reality of the physical world. Furthermore, the body's ability to zero in on what is significant, and then preserve that understanding in our background awareness, enables us to perceive more and more refined situations and respond more and more skilfully; its sensitivity to mood opens up our shared social situation and makes people and things matter to us; and its tendency to respond positively to direct engagement with other bodies; underlies our sense of trust and so sustains our interpersonal world. All this our body does so effortlessly, pervasively, and successfully that it is hardly noticed. That is why it is so easy to think that in cyberspace we could get along without it, and why it would, in fact, be impossible to do so.