The quick rise of emoticons confirms the intolerable ambiguity of the neocortical brain's advanced symbolic tools, and the problem this poses for successful communication between limbic creatures. But no matter how creatively designed, emoticons cannot compete with emotions—a delicately decorated parenthesis cannot depict nostalgia, jealousy, wistfulness, or envy. In our increasingly digitized world, e-mail is a convenient substitute for dialogue, but it does not convey the richness that humans unthinkingly transmit when they use emotionally tempered speech and facial expressions.

That missing limbic data is extraordinarily valuable. Telecommunications giants are currently sinking hundreds of millions of dollars into the race to develop affordable two-way video sent over a phone line or a cable television connection. Even with advanced information compression algorithms, a data stream with resolution fine enough to catch the subtleties of facial expression requires about four hundred kilobits per second. That should give us an idea of the massive sensory fire hose the limbic brain is tapping into as it discriminates remorse from disdain, delight from terror, indignation from admiration.

A RESOUNDING SUCCESS

Animals with little neocortical brain—dogs, cats, opossums—have emotions. So does the world's most interesting noncognitive mammal, the human infant. Infants are early masters of detecting and expressing emotions, which may help to explain their inborn fascination for faces. If you want to capture the attention of an infant, you will have more luck using an expressive human face than any other object in the world. Babies have an intrinsic appetite for faces: they look at them, peer at them, gaze at them, stare at them. But what exactly are they looking *for*?

Researchers now know that babies are looking at the expressions on the faces they fix on. In studying what attracts infant attention, researchers rely on measurements of gaze, because babies will look longer at novel objects than familiar ones. One can demonstrate in this manner that infants just a few days old can distinguish between emotional expressions.

What is so important to a baby about knowing his mother's emotional state? A scenario called the *visual cliff* suggests an answer. A baby is placed on a countertop, half solid and half clear Plexiglas. From the baby's point of view, he reaches an abyss when the Plexiglas begins, and he seems in danger of falling. The translucent plastic provides real, albeit invisible support, and thus, the visual cliff presents babies with an ambiguous threat. To an infant unschooled in the nature of Plexiglas, it appears he will fall, but since the surface is solid to the touch, he can't be sure. How does he make sense of it?

A typical baby crawls to the edge of the cliff, sees the possible precipice, and then looks at his mother—and makes his assessment of the cliff's lethality by reading her expression. If she radiates calm, he continues crawling, but if he finds alarm on her face, the baby stops in his tracks and cries. Whether they realize it or not, mothers use the universal signals of emotion to teach their babies about the world. Because their display is inborn, emotions not only reach across the gaps between cultures and species, but they also span the developmental chasm between mother and infant. Emotionality gives the two of them a common language years before the infant will acquire speech, the arbitrary symbolic system of the neocortical brain.

But an infant doesn't check up on his mother's face only when ambiguity threatens—babies continuously monitor their mothers' expressions. If a mother freezes her face, her baby becomes upset and begins to cry in short order. How much expressiveness do ba-

bies demand? Imagine a double video camera setup, in which mother and baby can see each other, but not face-to-face; each sees the other in their respective monitors. In real time, mother and infant look at each other, smile and laugh, and both are perfectly happy. If the baby sees a videotape of his mother's face instead of the real-time display, he quickly becomes distraught. It isn't just his mother's beaming countenance but her *synchrony* that he requires—their mutually responsive interaction. Restore his mother's face in real time to his TV monitor, and his contentment returns. Introduce a delay into the video circuit, and the baby will again become distressed.

An infant can detect minute temporal changes in emotional responsiveness. This level of sophistication is coming from an organism that won't be able to stand up on his own for another six months. Why should a creature with relatively few skills be so monomaniacally focused on tiny muscular contractions visible beneath the skin of another creature's body?

The answer lies in the evolutionary history of the limbic brain. Animals have highly developed neural systems for processing specific informational needs. The sonar system of bats serves them admirably in chasing small bugs in a pitch-black night; within the cacophony of their high-pitched echoes, they can see a world we are blind to. The intricate cellular structure of certain eels allows the precise mapping of perturbations in nearby electric fields; the eel recognizes other fish, including its prey, by the pattern of electricity their muscles cast off.

The limbic brain is another delicate physical apparatus that specializes in detecting and analyzing just one part of the physical world—the internal state of other mammals. Emotionality is the social sense organ of limbic creatures. While vision lets us experience the reflected wavelengths of electromagnetic radiation, and hearing gives information about the pressure waves in the surrounding air, emotionality enables a mammal to sense the inner states and the motives of the mammals around him.

The reptile brain, capable of reading the world and altering internal physiology to meet changing conditions, contains the germ of emotion. In mammals, emotionality vaulted to a vastly more sophisticated level. A young crocodilian can sense a possible predator behind a wavering frond, and it can mobilize its physiology to evade the threat. But a mammal can turn its advanced neural sensor not only on the inanimate world but also on other animals that are emotionally responsive. A mammal can detect the internal state of another mammal and adjust its own physiology to match the situation—a change in turn sensed by the other, who likewise adjusts. While the neural responsivity of a reptile is an early, tinny note of emotion, mammals have a full-throated duet, a reciprocal interchange between two fluid, sensing, shifting brains.

Within the effulgence of their new brain, mammals developed a capacity we call *limbic resonance*—a symphony of mutual exchange and internal adaptation whereby two mammals become attuned to each other's inner states. It is limbic resonance that makes looking into the face of another emotionally responsive creature a multilayered experience. Instead of seeing a pair of eyes as two bespeckled buttons, when we look into the ocular portals to a limbic brain our vision goes deep: the sensations multiply, just as two mirrors placed in opposition create a shimmering ricochet of reflections whose depths recede into infinity. Eye contact, although it occurs over a gap of yards, is not a metaphor. When we meet the gaze of another, two nervous systems achieve a palpable and intimate apposition.

So familiar and expected is the neural attunement of limbic resonance that people find its absence disturbing. Scrutinize the eyes of a shark or a sunbathing salamander and you get back no answering echo, no flicker of recognition, nothing. The vacuity behind

those glances sends a chill down the mammalian spine. The prelimbic status of mythological creatures that kill with their gaze—the serpent-crowned Medusa, the lizardlike basilisk, hatched from a cock's egg by toads or snakes—is no accident. These stories create monsters from ordinary reptiles by crediting them with the power to project out of their eyes what any mammal can see already dwells within: cold, inert matter, immune to the stirrings of limbic life.

To the animals capable of bridging the gap between minds, limbic resonance is the door to communal connection. Limbic resonance supplies the wordless harmony we see everywhere but take for granted—between mother and infant, between a boy and his dog, between lovers holding hands across a restaurant table. This silent reverberation between minds is so much a part of us that, like the noiseless machinations of the kidney or the liver, it functions smoothly and continuously without our notice.

Because limbic states can leap between minds, feelings are contagious, while notions are not. If one person germinates an ingenious idea, it's no surprise that those in the vicinity fail to develop the same concept spontaneously. But the limbic activity of those around us draws our emotions into almost immediate congruence. That's why a movie viewed in a theater of thrilled fans is electrifying, when its living room version disappoints—it's not the size of the screen or the speakers (as the literal-minded home electronics industry would have it)—it's the *crowd* that releases storytelling magic, the essential, communal, multiplied wonder. The same limbic evocation sends waves of emotion rolling through a throng, making scattered individuals into a unitary, panic-stricken herd or hate-filled lynch mob.

It seems a strange irony that we need science to rekindle faith in the ancient ability to read minds. That old skill, so much a part of us, is not much believed in now. Those who spend their days without an opportunity for quiet listening can pass a lifetime and overlook it altogether. The vocation of psychotherapy confers a few unexpected fringe benefits on its practitioners, and the following is one of them. It impels participation in a process that our modern world has all but forgotten: sitting in a room with another person for hours at a time with no purpose in mind but attending. As you do so, another world expands and comes alive to your senses—a world governed by forces that were old before humanity began.