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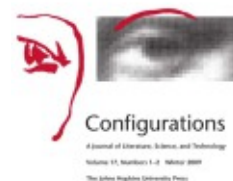
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Corporeal or Gesturo-haptic Writing

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It is through the skin that metaphysics must be made to re-enter our minds
—Antonin Artaud, *The Theater and Its Double*¹

The Curiously Archaic Present

Imagining a future in which alphabetic writing together with philosophy and literature as we know them will disappear, to be replaced by forms evolved from them, André Leroi-Gourhan assures us at the end of *Gesture and Speech* that the mentality and accomplishments of these artifacts will not be lost, since the “curiously archaic forms employed by thinking human beings during the period of alphabetic graphism will be preserved in print.”²

Leroi-Gourhan’s belief in the eventual demise of alphabetic writing and its illustrious products is in part self-dissolving: because it is written—and prompts a response—in the very medium whose disappearance it heralds, any answer from the archaic present would be perforce obsolescent before its time. It also seems fantastical and infeasible—outside the weightless imaginings of speculative fiction—to imagine the disappearance of anything so deeply folded into our Western historical and religious being and cultural self-identity as alphabeticism. (Of course, from a nonalphabetic standpoint such as that of Chinese orthography, its demise might seem less impossible

1. Antonin Artaud, *The Theater and Its Double*, trans. Mary Caroline Richards (New York: Grove Press, 1958), p. 99.

2. André Leroi-Gourhan, *Gesture and Speech*, trans. Anna Berger (Cambridge, Mass.: MIT Press, 1993), p. 404.

and more imaginable; but such a perception does not impinge on the question of archaization that prompts his prediction.) And yet is not the opposite belief to Leroi-Gourhan's just as outrageous? Can one really believe that alphabetic writing will never be archaic, will always be with us—that, in all possible, foreseeable, or imaginable futures of the human or posthuman extending our present technologized state, alphabetic inscription will go on being the principal cognitive tool and medium for recording, creating, and transmitting human knowledge, telling history, thinking philosophy, inscribing art and affect?

Leroi-Gourhan asks us to imagine our present, overwhelmingly alphabetic graphic practices as archaic. In an immediate empirical and manual sense that is not difficult: writing a text such as the present one by making a hundred thousand minutely different, attention-needing, and irksomely intricate finger movements on a keyboard is, in the scheme of practical things, hardly less archaic than laboriously incising cuneiform syllables one by one into wet clay. But this seems not to be in the direction of his prediction. One might, mindful of the alphabet's limitations in respect to rendering the prosodic elements of spoken utterances, invoke the mark-up language extensions to it that are being developed to remedy the situation.³ These so-called languages are scripts along the lines of an extended HTML embedded in text files, only, instead of enabling a browser to display a hypertext page, they enable machines to read alphabetic texts aloud. Their purpose is to improve the machine-readability of such texts along affective dimensions by providing tags for certain standardized types of prosodic effect; by decoding these tags, text-recognition software and speaker can voice a passable version of these effects. But, however novel and effective, textual augmentation to improve machine vocality embeds us further in, rather than taking us out of, the archaic alphabetic present.

Of course, it is possible that existing graphic practices are in the process of rendering the alphabet archaic. Certainly the explosion of visual images brought about by digital technology, the so-called second computer revolution, has resulted in many of the traditional semiotic functions performed by alphabetic writing (notably but not exclusively the display, recording, manipulation, and transmission of information) being usurped by visual artifacts—icons, tables, graphs, arrays, diagrams, charts, and maps replacing words; and it

3. Failure to render the prosody of spoken utterance in writing is the subject of Brian Rotman, "The Alphabetic Body," *Parallax* 8:1 (2002): 92–104. The present text is an elaboration of the last section of that essay.

has resulted in changes in subjectivity in directions quite distinct from that countenanced by alphabeticism and the textual protocols it furthers. But again, notwithstanding the threat to alphabetic inscription, this is not what seems intended by Leroi-Gourhan's prognostication, since visual practices that have long performed their own dance in relation to alphabetic writing are governed by an orthogonal relation to written texts rather than one of obsolescence or supersession. After all, the rivalry between words and images is as ancient as the alphabet's acrophonic emergence from pictograms, and the iconophobia so deeply embedded in the three alphabetic-text-based monotheisms of the West testifies to a long-established antagonism which would have to be dismantled or worked through, or otherwise rendered irrelevant, for the image to sufficiently destabilize the alphabetic word to constitute a source of its archaization.

What Leroi-Gourhan points to is not another move in an old battle between pictures and words, but a new medium: a communicational technology that would operate in a manner intimately and specifically related to the fact that the alphabet writes the movement of the speaking body. And the operative term here is *body*. For it is from an embodied ethnological perspective that he understands alphabeticism, writing being for him "the subordination of the hand to language"—a servitude coming to an end as *Homo sapiens* is "freed from tools, gestures, muscles, from programming actions, from memory, freed from imagination by the perfection of the broadcasting media, freed from the animal world, the plant world, from cold, from microbes, from the unknown world of mountains and seas."⁴ But forty years later, in the full flood of a digital transformation of our cultural infrastructure not suspected by him or his contemporaries, we are beginning to understand that bodies and their (our) immersion in the world are not so easily abandoned; that twisting free from corporeality merely replays an ancient fantasy of transcendence, rather than following a narrative of inevitable technological advance; and that contrary to withering the body or leaving it behind, it will be by uniting with it—merging, augmenting, capturing, and reengineering it—that technology may render our present alphabetic dispensation archaic.

This is because technology operates via a corporeal axiomatic that, despite prevailing wisdom, cannot be subsumed under the label "instrumental"; it can, in other words, be reduced neither to its role as a tool or prosthesis extending or replacing the body, nor to its role as a medium conveying/creating information and meanings. Be-

4. Leroi-Gourhan, *Gesture and Speech* (above, n. 2), p. 407.

hind and literally before both these is technology's materiality, its engagement with the body on a preinstrumental, prediscursive, pre-semiotic level of unmediated physicality; an engagement which, though subsequently a vital motivational and affective element of these roles, is necessarily outside the intentional forms and arrangements governing instrumentality.⁵

In light of this, responding to Leroi-Gourhan's provocation requires paying close attention to the connection between the alphabet and the body insofar as the former, seen in instrumental and semiotic terms, is said to notate or capture what is produced by the body's organs of speech.

Notating as against Capturing

The alphabet notates the signifying sounds produced by the organs of speech. A suitably specific departure, then, from its presumed archaic state might go by way of a double jump. Firstly, beyond the written mark: why interpret "writing" as notation, as the projection of body activity (here speech) onto a preset list of inscribed marks and a syntax? why not an asymbolic mediation—a sampling or capture, rather than a symbolic representation? Secondly, beyond the oral-vocal apparatus: why the restriction to the movements of the organs of speech, to the physiology and neurology of consonants and vowels? why not the movements of any and all of the body's organs and parts, oral-aural or otherwise, traditionally signifying and asignifying alike?

The dominant interpretation of notation and writing (outside the pragmatically unhelpful totalization of the latter within poststructuralist discourse) is that of media comprised of marks and syntax, with preassigned meanings ranging from the constative to the performative and operational. Thus: the originating example of the alphabet whose letters (along with punctuation and other marks) are operational signals for a human reader to reproduce specified sounds and their relation according to a juxtapositional and linear syntax; after it, the symbol system of Western five-line musical notation, where the sounds are to be reproduced by precalibrated instruments and the syntax has a simple two-dimensional structure; and then various systems for notating dance movements, of which Laban notation with its larger number of symbols and more elaborate two-

5. In *Embodying Technesis: Technology Beyond Writing* (Ann Arbor: University of Michigan Press, 2000), Mark Hansen argues at length that "the putting into discourse" of technology—by which he means the propensity to ignore what is here called technology's corporeal axiomatic, in favor of its discursively explicit instrumentality—is a major fault in twentieth-century thought on the subject.

dimensional syntax is the best known; and, older than alphabetic writing and in a category of its own, the vast field of mathematical writing with its open-ended array of ideogrammatic and diagrammatic symbols and multidimensional syntax that can itself become part of the meanings being mediated.

But against notational media are the practices, apparatuses, and modes of capture that constitute nonsymbolic media. In these, what is mediated operates under the regime of the enacted or reproduced rather than the symbolized. Thus, the phonogram and tape recorder do not notate sound in the form of symbols, but write it—capture it—as a direct signal to an apparatus able to reproduce (a perceptually indistinguishable version of) the captured sounds; likewise the camera, for the reproduction of captured visual scenes (though with the additional layer of convention and the subsequent interpretation of images not present with sound capture). Described in terms of figures of speech, notational media are regulated by metaphor and similitude, while capture media operate under the regimes of metonymy and synecdoche. Or, focusing on semiosis, notation effects a discrete algebraic framework or relational structure of prior differences, while capture presents a continuous topological model of posteriorly given internal differences.

The existence of media like photography, film, video, and sound recording, then, which are able to make a direct iterable trace of the look of the visual real or the sound of the audible real, addresses the second of the two jumps just indicated by way of an immediate suggestion: why not a parallel solution for the perception of the moving real? Is there any reason—biological, theoretical, or practical—why movement could not similarly be mediated? Could there not be a form of kinematic writing able to capture the perceptual feel of actual movements in space and time? The answer is yes, in fact there could: digital technology does indeed offer the possibility of a non-notational medium capable of reproducing the kinematic; it is called, appropriately enough, “motion capture.”

But before elaborating, it will help to gloss a common (and for our purposes not irrelevant) usage of the term “capture” that connects it to older forms of mimesis. Thus, within traditional theatrical and ceremonial discourse one talks of imitation, mimicry, copying, and quotation as modes of capture, in which the human body and voice are used to capture the movements, postures, and sounds of humans (and also of animals and machines). But these actions lack any trace or record of themselves, and though they are vital forms of capture within artistic performance they are not a form of writing as that term is interpreted here—their impermanence being precisely the point of

the epithet that theater is “written on the wind.” From the opposite direction there are those media which do indeed record and notate (unwittingly) a mimicked movement, though this aspect of them—which legitimates calling them written media—is not usually foregrounded. Examples would be painting, carving, calligraphy, pottery, sewing, knitting, and weaving, all of which achieve a certain freezing of actions by reproducing traces of human movements (rather than the movements themselves) as inextricable components of the plots, written messages, depicted images, tapestries, and textiles whose production is their primary function.

Of these modes of unintentional capture, painting by virtue of its cultural preeminence is exemplary, its recording of the artist’s gestures through brushstrokes constituting what is recognized to be an essential aspect of the art; this is, however, an aspect discursively downplayed and neglected when compared to painting’s representational function. Art historian James Elkins, battling this neglect of the sheer materiality of paint and arguing against the marginalization of the embodied action and painted gestures in favor of the depicted content, insists on the paint-psyche connection: paint “embeds thought,” it is a “cast of the painter’s movements, a portrait of the painter’s body and thoughts”; seen thus, paintings, particularly oil paintings, become records of a thousand accumulated strokes of the brush which “preserve the memory of tired bodies that made them, the quick jabs, the exhausted traces, the careful nourishing gestures.”⁶ Less deliberate and localizable, infamously brushless as it were, and detached from the depictive and representational agenda of figurative art are the so-called action paintings of Jackson Pollock—paintings that enact a version of the corporeal axiomatic in that they embed the feelings, attitudes, and unconscious knowledge of the artist’s entire body. In the development of Western art, the resulting capture of body movements produced an entire style and language of painting—abstract expressionism—which rerouted the itinerary of modern painting. In the present terms, one can say that such expressionism is abstract precisely to the extent that concrete content has mutated from being a depiction of the object—which is precisely the domain of a notational medium—to the arena of capture in which content is encompassed transnotationally as (the trace of) performed movement.

Abstract expressionism exhausted itself long ago, its relation to the traced body of the artist giving way to the live mobile presence of his or her body in performance art, or by a transfer of embodi-

6. James Elkins, *What Painting Is* (London: Routledge, 1999), p. 5.

ment from artist to viewer in installation art, where the viewing body is kinematically augmented by being required to move in, through, and out of the space created by the installation. But though the installation's eclipse of the traditional flat image effectively terminated the function of the brushstroke as frozen movement, the presence of that sort of mediated trace of the body's action did not disappear but migrated to digital technology, where the potential for directly capturing gesture, as well as recording or tracing it in painting, has been given a new and still developing itinerary—an itinerary whose emergence from the original haptic device of the computer mouse was unintentional. Thus, as one knows, the mouse is the enabling technology of the Graphic User Interface; invented thirty years ago as a move-and-click device for registering the user's (x,y) -position, it has in addition to this function since become a digital paintbrush able to capture (traces of) the highly restricted movements and gestures of the hand swiveling at the wrist and sweeping across a flat surface. The resulting brushstrokes can be used to create certain kinds of digital paintings (mousegrams one might call them) that exhibit these gestures—or, rather, reduced, metonymic projections of them—in a captured state.⁷

Action painting, and painting generally, captured traces of the artist's activities—imprints or residues of movement; whatever thought and feeling painting was able to embed in the painted surface via its pourings and brushstrokes had to be accomplished through these immobile reductions of the dynamic gestures and movements of the body. Motion capture is able to avoid mere residues, and on the contrary delivers a form of kinematic writing not confined to such stationary traces.

Motion Captured

One captures the motion of a moving body through the use of tracking technology, by attaching sensors (responsive to visual or magnetic or aural or inertial tracking technologies) to chosen points on the body (of an animal, machine, human) and taking periodic readings (i.e., digitized samples, via cameras, magnetic sensors, and so on) of where in space these sensors are as the body moves. In fact, in the case of hapticity, the body might move (as in stroking) but does not have to; even potential movement, the propensity to move—pushes, pulls, grasping—which issues in pressure and dynamic resistance, can be captured by force-feedback devices closely related to tracking

7. Some examples of mousegrams can be found on my website at http://www.wideopenwest.com/~brian_rotman/mouse-display.html.

sensors. In both cases, the resulting data set of sampled readings contains the information needed to construct a reproduction of the original actual or potential motion of the chosen aspects of the body in an unlimited series of situations.

As the phonogram and camera enable the storage and production of sound and vision, so motion-capture technology stores and reproduces kinesis. Two differences, however, should be noted. First, developmental: unlike the capture of sound and vision, which were originally analogue and only subsequent to their technical, cultural, and artistic establishment became digitized (allowing a contrast between the old analogue content and its digitized form), motion capture leapfrogs this history by producing digital files from the outset. Second, operational: the haptic sense, unlike the passive recording of sound and vision, is captured actively; observation is not enough, for in order for the sense of touch to be registered at all some degree of manipulation must precede perception. But, notwithstanding the complications these differences imply, there is a functionally complete analogy between digital sound, video, and kinesis recording, in that, as in the first two, the readings of motion-capture sensors are raw data, providing a metonymic sampling of their target motions as opposed to the metaphoric and symbolic representation provided by all notational forms of writing.

The kinetic patterns stored by motion capture disembody and deterritorialize the original motion from the place, time, circumstances, physical form, cultural particularity, and presence of its performance. Released from their originating situations and instantiations, they can be reterritorialized onto a still-proliferating range of physical situations and reembedded within any number of contexts. Captured motion is able to be endlessly reinstanced and rerealized—to drive two- and three-dimensional animations, to effect the movement of an automaton, a puppet, a robot, a cartoon figure, an electronic doll, a Virtual Reality avatar, or indeed to become the movements of another human body.

This latter facility has been exploited by the Australian body artist Stellarc, as part of his extended campaign to demonstrate that “the body is obsolete” (by which he means the nontechnologized, “natural,” purely biological and unprosthetic body—were there to be such a thing): in a recent installation/experiment he sent readings of his arm movements via the internet to drive the (suitably prepared) arm of a remote host, a person elsewhere on the planet, causing her to stroke her breast without any conscious or willed effort on her part. The result is a form of transposed physicality: for the remote person it appears as a kind of automatism or possession from with-

out, and for Stellarc or anybody else initiating it, it is a pseudo-masturbation or self-pleasuring enacted through another's body.

Once motion is digitally capturable it becomes digitally generatable: capture by means of readings and simulation by means of algorithms being two sides of the same process. Though the technology is still in the initial and developmental phase, captured and simulated gestures are already in widespread use, figuring in art objects, computer games, virtual choreography, animated films, different kinds of electronic installations, and various realizations of the concept of electronic or virtual theater.

Likewise, though subject to different technological and cultural imperatives, captured forces operating via force-feedback devices are enabling varied forms of haptic action at a distance. These range from the simulated handling of molecules by research chemists and telesurgery effected through visually enhanced feedback loops, to cross-planetary arm-wrestling and the inevitable attempt to realize sex-at-a-distance, or teledildonics, which (according to its adherents and would-be practitioners) would allow a participant to feel his or her avatar sexing another's avatar—or, as they put it, “computer-mediated sexual interaction between the Virtual Reality presences of two humans.” Differently and more richly productive, force capture would include the full haptic modalities—all the forms of stroking, touch, pressure, and dynamic contact—that organize the uncharted interactions and communings that are assembled within our present-day construction of human embodiment.

Motion-capture technology allows the communicational, instrumental, and affective traffic of the body in all its movements, openings, tensings, foldings, and rhythms into the orbit of “writing.” There is in this no limit, at least in principle, to what about or of the body is capturable: the locomoting, cavorting, dancing, gesturing body; the arm, hand, torso, and head of the signing body; the ever-present and ubiquitous gesticulating body accompanying speech; facial expressions; transient twists and turns of the body in performance; shrugs, eyeblinks, winks, barely perceptible tremors and nods of the socially communicating head. And not only the signifying and asignifying moves and postures of people, but also those of machines and animals and objects—from a chimpanzee's grin or the throbbing of a massage chair, to the movements of a musical conductor's baton, the swing of a golf club, the vibrations of a violinist's bow, and so on, for actions that will exist purely by virtue of being invented/captured by this very technology. All of this constitutes a gesturo-haptic medium of vast, unrealized, and as yet untheorized or critically narrativized potential.

And what, to revert to our original question, does this imply for alphabetic writing and for going beyond the writing of speech? And would not this in its turn go beyond the hegemony and authority of written discourse itself? Could motion capture be about to induce a transformation as radical and far-reaching for the body's gestural activities and organs of grasping and touch as that which writing accomplished for the organs of speech? Could bringing (a digitally objectified) gesture out from under the shadow of the spoken word install a new order of body mediation? In such an installation it is not a question of the gesturo-haptic equaling the present-day importance and centrality of speech (which would be absurd), but rather the putting into place of an experiential, as opposed to a linguistic and spoken, modality. Gesture's relation to speech is complex and many-leveled: it can accompany and be intricately synchronized with speech (gesticulation), can operate counterorally and function to displace or problematize speech (so-called emblem gestures), can be a rival or alternative linguistic medium to speech (Signing), or can operate inside speech as its armature and the vehicle for its extra-word affect (prosody). These gestural activities augment and condition speech on an automatic, everyday basis, which makes them ideal for designers of human-machine interfaces, since there is no difficult learning curve: "Communicative behaviors such as salutations and farewells, conversational turn-taking with interruptions, and referring to objects using pointing gestures are examples of protocols that all native speakers of a language already know how to perform and can thus be leveraged in an intelligent interface."⁸

Interface design relates to a strictly instrumental and pragmatic aspect of the gesture-speech nexus in which gesture is seen as augmenting and combining with speech. In a more critical and oppositional sense, gestures can be counterposed to speech in that they represent forms of principled silence offering so many different ways of saying nothing. In this sense, what the gesturo-haptic amounts to is a new mediation of silence, a means of arriving at a new and productively positive valorization of a once contemptuously silent—dumb, arational, emotional, and hence (though I'll not pursue it here) female—body; or better, a new body in a constant state of arriving, since the saying of nothing, becoming mute, is coeval and coterminous with speaking, and hence a never-ending business of creating a wordless interior to speech. To achieve the body without

8. Justine Cassell, T. Bickmore, L. Campbell, H. Vilhjálmsón, and H. Yan, "More Than Just a Pretty Face: Conversational Protocols and the Affordances of Embodiment," *Knowledge-Based Systems* 14 (2001): 55-64, quotation on p. 55; found on-line at <http://gn.www.media.mit.edu/groups/gn/pubs/embodiment.pdf>.

organs of speech (as Antonin Artaud might have put it), it is necessary first to dumb the body, de-organize it, divest it of speech, silence it—so that, no longer governed by the sayable, it may become the field of other productions, other desires, can be alive to other semiotics, other mediations (here the gestural) that speech, unable to process silence except as an absence of itself, and yoked to its alphabetically written form that suffers from precisely the same problem, has always been only too pleased to elide.

Nobody has argued with more passion and effect against such elision and the corporeal truncation it rides on than Antonin Artaud. Precisely the opposition between the gestural and the linguistic in relation to the means and protocols of theatrical performance was the overriding justification and aesthetico-moral force of his theater of cruelty. For Artaud, the purpose of theater was the induction of feeling, emotion, and affect: the bringing about of a physical, and hence spiritual and metaphysical, transformation of the bodies of the audience, the creation of a corporeal upheaval in its recipients whose effect on their subjectivity would be as violent, far-reaching, and unignorable as the plague. Speech could not achieve this. Artaud, requiring his theater to function with a “pure theatrical language which does without words, a language of signs, gestures, and attitudes,” knew that speech denigrated and marginalized gesture, whereas what was needed was a reversal that rerouted the dominion of thought over the body: “gesture . . . instead of serving as a decoration, an accompaniment of a thought, instead causes its movement, directs it, destroys it, or changes it completely.”⁹ Artaud’s program of theatrical embodiment—his refusal to subordinate the stage to the performance of written scripts instead of the imperatives and possibilities of screams, shouts, gestures, primitive signals, and silences—did for modern theater what Pollock’s refusal of intentionality and his insertion of the body onto the canvas did for painting: a reestablishing of the gesturo-haptic at the expense of the depictive, the representational, the linguistic, and the symbolic.

Becoming silent, acting mute, is becoming infant—understandable as part of a willed accession to the state of prespeech, a return to or renegotiation of the past, except that what is involved in such a move is not a “return” to the past or any kind of regression, but a reconfiguration of the present/future by altering its genesis, its supposedly necessary and irrevocable linkage to that past, by reoriginating itself. The result would be an alteration in the condition for the possibility of being human, a quasi- or neo-primitiveness in which future humans partook of the characteristics of (present-day) chil-

9. Artaud, *Theater* (above, n. 1), p. 39.

dren. In this cultural neoteny whereby the adults come to resemble the young of their evolutionary forebears, speech would not of course disappear but on the contrary would become reconfigured (as it was once before when transformed by alphabetic writing)—better: re-mediated into a more mobile, expressive, and affective apparatus—by the nascent gesturo-haptic resources being ushered into existence by the technology of motion capture.

Gesturo-haptic Writing

Plainly the gesturo-haptic achieves both departures from the alphabetic—beyond notation and beyond speech—suggested earlier: its capture of the moving human body (not to mention animals and machines) far exceeds the alphabet's inscribing of the organs of speech. Nevertheless, the gesturo-haptic presents itself as a form of writing that bears a fundamental kinship with alphabetic writing by making available a set of effects parallel to the virtualizing action performed on speech by the alphabet. It certainly extends to gestures the same kinds of conceptual and pragmatic mobility, spatio-temporal dislocation, freedom from the contexts of their production, and analytic transparency as the notational system of alphabetic writing afforded human speech. For as we know, the alphabet, by allowing (insisting) that words become self-standing objects, discrete items of awareness that could be isolated, studied, compared, replicated, and systematized, gave rise to grammar, written discourse, and literature, and a science of linguistics. Likewise gestures with respect to their digitally captured forms: they too are now being identified, individualized, examined, replicated, and synthesized as discrete and autonomous objects of conscious attention. The opportunity is thus opened for such newly digitized and objectified gestures to emerge from the shadow of speech, to be "grammaticalized" and to give rise to a gesturology whose theoretical implications would extend to a rethinking of the status of human corporeality. More practically, such a gesturology might serve as an enabling semiotic frame allowing the gesturo-haptic to function as a medium for Sign to possess a stock of iterable gestural artifacts constituting a "literature." It might also do for the principled silences and unwords of the gesturo-haptic body (not least the production of that body's presence to itself and to others) what linguistics has done for spoken language on the level of positive knowledge and what genealogies of discourse have striven to do for the constitution of the speaking subject.

But at the same time, the gesturo-haptic is a form of writing that exceeds the textual. Insofar as the "text" can never be separated from the hermeneutic and the interpretative activities of deciphering, of

reading, of engaging with a site or artifact whose primary function is to signify, the gesturo-haptic is outside the text: its mode is exterior to the notion of the text, the gram, or the trace of anything prior to its own performance, since it works through bodily enacted events and the necessity of being experienced as these occur. In this sense it is profoundly and inescapably exo-textual: a mediating technology that escapes the purely signifying and the representational by operating within interactive, participatory, and immersive regimes. In other words, the gesturo-haptic does not communicate in the accepted sense (source A sends signifying item B to a recipient C); it does not convey messages, send information, transmit meanings, or bear significations that exist and are determined in advance of its action. What it traffics in are corporeal events in so-called real time, processes and proceedings that have to happen, and in happening—better: in the manner of their happening—engender meaning; and in such a mode of mediation there is no pure B uncontaminated by an A and C, or vice versa, but rather a triangular interdependency of “messages” and sending and receiving bodies. More conventionally put: gestures (however isolatable these might be as discrete items of communication) are not signs in Saussure’s or Peirce’s sense, except insofar as they become so retrospectively by coming to signify (if that is the term) their own happening and its expected/habitual affects; their meaning in this retrospective semiotization is the fact and embodied consequences of their having occurred.

Yet, to repeat, however conveniently naturalizing, this after-the-fact discursive description of the gesturo-haptic should not be allowed to mask the fundamental difference—the gap between language and experience, discourse and embodiment—separating it from purely textual writing. Of captured items such as a handshake, a shrug, a squeeze of the shoulder, a kiss, a turning aside, and so on, one can say that despite their conventional meanings, what is salient about them—their importance, value, and strategic or instrumental interest—is not derived from these meanings. Rather, it lies in the fact of their taking place, and in the subsequent psycho-social-corporeal effects (of affect, safety, assurance, threat, etc.) that they induce and could only induce as a result of having actually occurred, and having done so in the manner, style, and force (all that constitutes what one might call their gestural prosody) in which they did.

To think otherwise about gesturo-haptic mediation, to allow it to be reduced to a species of discourse and to assume its effects to be wholly articulable within representation, is then a double misapprehension: it misperceives how the medium works through bodily transformation and not linguistic symbols, and, less transparently, it

obfuscates its direct—prediscursive—action on the body, what I earlier called technology's corporeal axiomatic, and hence its action in inducing and installing subjectivity.

Technologized Subjectivity

"Cultures," Merlin Donald reminds us, "restructure the mind, not only in terms of its specific contents, which are obviously culture-bound, but also in terms of its fundamental neurological organization."¹⁰ Likewise, as evolutionary neurologist Terrence Deacon argues, a cultural phenomenon such as the development of language and its ramifications can be seen to have altered the size and overall capacity of the brain (rather than, as is usually supposed, the reverse).¹¹ In Donald's case, the arena of this restructuring is the evolution of cognition through neurological changes brought about by culturally mediated systems of external memory (writing, for example), which is evidently an instance of technologically mediated exogenesis; as such it can be generalized from the memory-storage functions of written notation to their extension in the present account—capture—made available by the medium of gesturo-haptic writing.

A principal mode of exogenesis is synthetic assemblage, the coming (or putting) together of independent activities to form a new, functionally unified, and autonomous entity. Two evolutionary examples, far removed from motion capture, illustrate the point. One is human number sense: the ability to number things in a collection has been shown by Stanislas Dehaene, contrary to the accepted view, not to be an endogenously formed faculty, but a capacity assembled by social demands (the imperatives of mathematical practice) from differently evolved and independent brain activities, each with its own functionality having no prior intrinsic or necessary connection to number.¹² The other is speech itself, which, though evidently a unified faculty (the object of linguistics), is, as Deacon makes clear, the result of a coming together of many separate neurological capacities and physical changes, from the propensity for vocal mimicry through hemispheric specialization of the brain to the descent of the larynx enabling a sufficiently adequate range of vowel production.¹³

The same synthesis enables a gesturo-haptic form of exogenesis.

10. Merlin Donald, *Origins of the Modern Mind: Three Stages in the Evolution of Culture* (Cambridge, Mass.: Harvard University Press, 1991), p. 14.

11. Terrence Deacon, *The Symbolic Species: The Co-evolution of Language and the Brain* (New York: Norton, 1997).

12. Stanislaw Deheane, *The Number Sense* (Oxford: Oxford University Press, 1997).

13. Deacon, *Symbolic Species* (above, n. 11), p. 353.

Captured gestures can become the elements for previously nonexistent and unknown assemblages of body movements—*assemblages* which are the site of neurological restructuring and in the presence of which new neurophysiologies, forms of corporeality, and subjectivities come into being. Going far beyond the neurological examples of number sense and speech, these assemblages will not be confined to the synthesis of elements drawn from internal and pre-existing brain activities. Once the body's movements, gestures, and hapticities are captured and digitally manipulable they become, as we have seen, *deterritorialized*, which means they can be assembled outside the neurological confines of a (any) individual brain and put together through networks and culturally mediated collectivities, both existent and yet to be created. In this expanded field, captured body movements become the means of creating subjectivity—*selves*, subjects, and subject-positions—differently operative and differently sourced from those available within alphabetic writing. By allowing gesturo-haptic mediation this kind of constitutive role, such a rewriting of the corporeal provides a particular—technological—concretization of Gilles Deleuze's paraphrase of Spinoza's insistence on our ignorance of the body's capabilities in that it reveals the body as both vehicle and recipient of becoming, as the site of a movement to and from the outside of the human, whose contemporary technological facilitation can be seen in the emergence of a bio-technical subject which is still in the stage of being characterized—dispersed, pluralized, decentered, distributed, etc.—as negations of what it is superseding.

But however productive this sort of nonendogenous assemblage is, it presents only one strand—the explicit and manifest aspect—of the exogenesis brought about by technology. Technologies, as we have observed, have the potential to restructure our neurology, to impinge on the body and direct its psychic envelope along different channels—conventionally, either as prosthetic extensions of physical, cognitive, and perceptual powers (the usual effects of tools, machines, apparatuses) or, as media, through the corporeal changes of affect and subjectivity wrought by the cultural products they make possible (the usual effects of the arts, literature, film, and so on). But less obvious and no less interesting, more so perhaps because they operate invisibly, are the nonexplicit, nonintentional, and precultural corporeal effects of technologies: their implicit restructuring of time and space, their facilitations of new modalities of self, the work they do behind or beneath or despite the explicitly instrumental or signifying functions they are known by and are introduced to discharge.

This double aspect of technological restructuring operates at all levels, from large-scale infrastructural phenomena such as electricity

distribution or computer technology to the most banal machinic device. Thus, a trivial but paradigmatic example of the latter: the pop-up toaster is a tool invented to prosthetically extend the cooking body; less obviously, it contributes to the atomization of attention, the microperiodization of temporality, and the intermittence of conscious awareness that are endemic to an electronically industrialized infrastructure. Likewise, but in a diffuse and more indirect way, one can identify precultural, nonintentional, technologically driven changes in subjectivity associated with developments in computational and visualization technologies.

Moreover, the technology in question can be primarily cognitive, as is the case with the medium of alphabetic writing. Here the explicit, intentional functions and effects—the prosthetic extension of speech, written discourse, the creation of Western literacy together with its wider technological and intellectual outworks—are evident enough, as are certain much-commented-upon concomitant and collateral psychoneurological effects of the alphabet, such as the emphasis on linearity, the inculcation of analyticity, and the promotion of context-free and atomized modes of thought. Less evident, in fact quite invisible (as to be expected, given its action as part of the technology's corporeal axiomatic), is alphabetic writing's reconfiguration of the body at the level of neurophysiology—an effect that installs a transcendental fissure or onto-theological resource inside its texts whose ultimate form is an abstract, disembodied being: the God of Western monotheism.¹⁴ In light of this, to speak of the end of the alphabet is to suggest the possibility of a shift in Western deism, a reconfiguration of God and the God-effect, as momentous as the alphabet's inauguration of that being. The stakes for an end to the alphabet would then be high indeed, and, to return to Leroi-Gourhan's fantasy of postalphabeticism from which we started, we have to wonder if such a thing is feasible: is an end to alphabetic writing or, less totally, a significant shrinkage in its importance, controlling functionality, and hegemonic status, thinkable from within that very writing here in the West?

Impossible to say, but Leroi-Gourhan's question of the ultimate limits and end of the alphabetic text—like Marshall McLuhan's parallel probing of the status of typographic man of the same period—has now been given an extra twist by digital technology, a new way of thinking the question in terms of the impending transformation of the body and its subjectivities brought about by the possibilities of gesturo-haptic writing.

14. Or so I reason in "Alphabetic Body" (above, n. 3).