Review Essay*

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It is often the case that new technologies revolutionize areas of intellectual endeavor. They can lead to new analytic rigor, challenge old habits of thought, and raise new theoretical questions. Historically, the most significant technological invention for the study of language was probably alphabetic transcription systems. However, the invention of portable sound-recorders also facilitated important new directions in language analysis because it enabled investigators to record and transcribe elicited utterances more accurately, as well as 'naturally occurring' speech in social contexts. In a similar manner, the availability of inexpensive and portable film, and more recently video, has stimulated renewed interest in visual aspects of language-in-use, especially those movements of the arms and hands — somewhat loosely referred to as "gestures" — that accompany speech in discursive practices.

However, new technologies do not, in themselves, generate new theories. When film, and later, television, were first developed, it was some time before the new media transcended conventions inherited from the theater. Likewise, it will probably be some time before a fully embodied conception of 'language' transcends many habits of thinking and analysis inherited from a linguistics that has customarily attended only to speech. The papers presented in this volume indicate that this process is currently underway. One must wonder however, whether the category of 'gesture' will itself turn out to be limiting when there are many other human practices in which body movement and speech are integrated (e.g. signed languages, numerous idioms of dancing, and theater, ritual and ceremony, and skill acquisition of many kinds — see Farnell 1999; Ingold 1993a,b,c; Keller and Keller 1996). A more broadly conceived approach to the modality of human movement *per se* might be crucial in order to avoid the problem, but this requires a more sophisticated theory of embodied human action than is envisaged by most scholars specializing in gesture studies to date.

Adam Kendon notes that historically, with one or two notable exceptions, linguists from Saussure onwards have almost always defined 'language' in structural terms. The reorientation of linguistics under the influence of Chomsky, however, " ...turned it into a kind of mental science" (page 49), and so gesture disappeared altogether as a topic of inquiry. He also notes that the subsequent development of cognitive studies has generated renewed interest in

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gestures. "If language is a cognitive activity and, if as is clear, gestural expression is intimately involved in acts of spoken linguistic expression, then it seems reasonable to look closely at gesture for the light it may throw on this cognitive activity" (page 49). Focus on such cognitive activity appears to dominate this emerging field at present, bringing with it a problematic adherence to a Cartesian mentalism typical of what Harré and Gillett (1994) have referred to as "the first cognitive revolution." The research presented by the editor of this volume, psycholinguist David McNeill, and his students, is typical of this paradigm. However, there are also interesting anthropological contributions by John Haviland, Adam Kendon, Charles Goodwin and communications scholars Curtis Le Baron and Jürgen Streeck which offer alternative perspectives. In contrast to psychological/cognitive approaches, their data comes from naturally occurring discourse in ethnographically rich environments, rather than elicited or experimental contexts, and is informed by developments in linguistic anthropology.

This collection thus offers an interesting cross-section of current approaches to the topic of gesture and its relationships to spoken language from a range of disciplines, including linguistic anthropology, communication studies, psycholinguistics and cognitive psychology. The papers began as invited presentations at a conference held in conjunction with the Summer Linguistic Institute at the University of New Mexico in 1995, and organized by two leading scholars in the emerging field of gesture studies, Adam Kendon and David McNeill. The chapters are organized into four sections, following McNeill's introduction to the volume: (1) gesture in action; (2) gesture in thought; (3) modeling gesture performance, and (4) from gesture to sign.

Before discussing selected papers and each section in more detail, I situate this volume historically by providing a brief overview of the study of 'gestures' in anthropology, which I trust may be of interest to JASHM readers.[1]

The Study of Gestures in Anthropology

Although studies of gesture can be traced back as far as Greek interests in rhetorical performance, the role of such co-expressive body movement in language-use has traditionally been excluded from what has counted as 'language' in mainstream linguistics, in which the terms 'speech' and 'language' have often been used interchangeably. As Dennis Tedlock (1983) pointed out, any elements of performance that could not be transcribed using the Greco-Roman alphabet (and elaborations such as the IPA) have been relegated to the status of 'paralinguistic', 'non-verbal' or 'non-linguistic' and thereafter largely ignored. 'Non-verbal communication' has, by definition, been a domain of inquiry in behavioral psychology rather than linguistics.

Within anthropology, however, during the discipline's formative period the evolutionist search for the origins of language motivated a brief but significant flurry of interest in the subject of gestures. For example, the Victorian English anthropologist, E. B. Tylor (1865) regarded sign languages and gesture as components of a universal "gesture language" more primitive than speech or

writing, and he expected the elements to be universally recognizable. Tylor believed he was close to discovering the original sign-making faculty in humans that once led to the emergence of spoken language (Farnell 1995a).

Meanwhile, in the United States, Tylor's work provided theoretical support for Garrick Mallery's extensive collection of data on sign languages and gestural systems. Mallery (1881) compared Native American signing systems with deaf sign languages and provided accounts of the use of gesture in classical times, in Naples, and among contemporary actors. The first publications of the newly established Bureau of American Ethnology in Washington DC were entirely devoted to accounts of Mallery's research on the subject (1880a; 1880b; 1881). On both sides of the Atlantic, however, this focus quickly disappeared once social evolutionism and the fascination with 'origins' waned (Farnell 1995).[2]

In typical contrast to the universalist theories of "gesture language" espoused by these evolutionists, Franz Boas stressed the learned, culture-specific nature of body movement. He recognized that artistic form and cultural patterning were present in the complex hand gestures and other body movements that accompanied song, oratory, and the performance of oral literature, as well in American Indian dances (Boas 1888; 1890; 1927; 1972). Margaret Mead reports that Boas once said to her, "If I were going to Bali, I would study gesture" (1976: 212). It follows that in the 1930's, David Efron, one of Boas's last students, used filmed data to make a systematic study of cultural differences in the gestures of Yiddish speaking Jewish immigrants and Italian speaking immigrants in New York City (Efron 1972[1941]). The Boasian goal of this research was to establish the primacy of culture over race as a means to understand social behavior, a topic that took on particular urgency in the 1930's, when racism in America and Nazism in Europe were powerful forces.

Unfortunately, despite Boas's long-standing interest in Kwakiutl gestures, dances and "motor habits," he chose to exclude "gesture-language" from his influential introduction to the *Handbook of American Indian Languages* (1911). Aligning body movement with "musical means of communication," he limited his consideration to "communication by groups of sounds produced by the articulating organs [of mouth and tongue]" (1911: 10). Boas thus inadvertently set the pattern for the exclusion of body movement from future research in American linguistic anthropology. Boas probably aligned movement with music because of his theoretical orientation towards dances and dancing as emotional and symbolic expression; a part of his theory of rhythm in art and culture (Boas 1927). However, he was also without the necessary technology –– such as film and a movement transcription system — which would have enabled him to explore links between body movement and speech in greater detail.

In 1930, at age 70, Boas returned to the Kwakiutl with a motion picture camera and wax cylinder recording machine in order to study gestures, games, dances and "methods of manufacture." Always eager to investigate any new channels that might be fruitful, Boas thought the new filmed data could provide him with "adequate material for making a real study" (Ruby

1980). According to his daughter Franziska, he had also heard of Rudolph Laban's work in Germany on movement analysis and transcription, and wanted to know whether Labanotation was being expanded for wider use than Western theatrical dances.[3]

Two factors emerge from Boas's interest in body movement that presage later developments. First, Boas recognized the potential gains to anthropology of a broad examination of many different idioms of human movement rather than a narrow focus on gesture (or dances) *per se*. This anticipates the development of holistic approaches to the anthropology of human movement proposed by Kaeppler (1967) and Williams (1975). Kaeppler's "ethnoscientific structuralism" and Williams's "semasiology" share this important insight, although they differ from Boas in including detailed analytic attention to diverse relationships between spoken signs and action signs. Second, Boas recognized the analytic possibilities that a transcription system like Labanotation offered the anthropological study of human movement, and saw the value of combining its use with recorded filmed data.[4]

Boas's student, Edward Sapir also recognized that manual gestures interplay constantly with speech in communicative situations and that "gesture patterns" were culture specific. He sought to counter prevailing myths about 'primitive languages' and 'savages' who could not converse in the dark because they needed gesture to eke out the meaning of their scanty vocabulary (1985[1949]: 7, 104-5; also cf. Tyler 1865). Sapir, however, considered gesture to be "excessively supplementary" to phonetic language (1985[1949]: 7) and the linguistic and social significance of what he referred to as an "elaborate and secret code" was left unexplored (Sapir 1958[1949]: 556).

Likewise, Benjamin Lee Whorf (1956) made programmatic suggestions about the integration of spatialized metaphors in speech and gesture when he noted that, unlike the Hopi, speakers of English "are more apt to make a grasping gesture when we speak of grasping an elusive idea, than when we speak of grasping a door knob," but the statement went unnoticed until recently (see Farnell 1996 and 2000).

The smooth surface of linguistic science was not theoretically challenged until the 1950s with the pioneering linguistic work of William Stokoe on the structure of American Sign Language (1960), and La Mont West Jr.'s research into Plains Indian Sign Language (1960). Radical at the time, Stokoe and West made the case that signed languages were indeed natural languages and amenable to formal structural analysis. Both scholars developed transcription systems specific to their data. West's research was strongly supported by Alfred L. Kroeber and Carl F. Voegelin, both of whom who published reports on West's sign language project (Kroeber 1958 and Voegelin 1958).

In the 1960s, anthropologist Ray Birdwhistell (1970), inspired by what he saw as Sapir's anticipation of the interdependence of linguistic and kinesic research, envisaged a discipline of 'kinesics', that would parallel linguistics but deal with the analysis of visible motion. He did not, however, explore interrelationships between speech and body motion. Sapir had speculated that the

symbolism of gesture was relatively unconscious but could be psychologically more significant than words (1985[1949]: 105). We see this influence emerge in Birdwhistell's association with behavioral psychologists such as Sheflen, and the limited application of kinesics to micro-analyses of body movements in laboratory and experimental settings, plus interaction in clinical settings. Unlike Boas, Birdwhistell considered more formalized movement systems such as dances, mime and religious ritual to be beyond the interests of kinesics. This was unfortunate as it narrowed the scope of the potential field, separating kinesics from much that was of interest to mainstream anthropology.[5]

Gesture as Part of Language: An Emerging Paradigm?

In the early 1970s, influenced by the work of Birdwhistell and Irving Goffman, Adam Kendon (1972) first made a case for regarding "gestures" as part of language. The chapters in the book under review seek to continue this specific line of inquiry, providing a cross-section of current approaches and analyses in which "gestures are regarded as parts of *language itself* — not as embellishments or elaborations, but as integral parts of the processes of language and its use" (McNeill, page 9).

Some contradictions are immediately apparent, however, as is perhaps normal in any new field of study. To say "language and gesture are integral parts of a whole," in fact, separates language from gesture, and is not the same as regarding gestures "as part of language itself," (page 9). This lack of clarity glosses over some important theoretical differences among the authors that the editor either misses or chooses to dismiss. For example, whereas some see *language* and gesture as two separate semiotic media, others see *speech* and gesture as two semiotic modalities that *together constitute language.*

As one might expect, these kinds of theoretical differences align themselves along disciplinary affiliations. Contributions from cognitive psychology and psycholinguistics analyze data elicited in experimental settings, and study language as an internal, individual mental/cognitive process. The "origins of gestures" are today sought in the "real-time mental processes of individuals" (page 9) rather than the evolutionary history of humankind typical of 19th century investigators. In contrast, the contributions from linguistic anthropology, conversation analysis and communication analyze naturally occurring social interaction and focus on the co-expressive functions of speech and gesture in communicative situations. According to these perspectives, "language" is socially constructed discursive practices that are constituted by co-expressive speech and body movement.

While the editor would have us see these differences as merely complementary, I find that a theoretical tension emerges in the volume between research located firmly within the first cognitive revolution and that grounded in a post-Cartesian, discursive theoretical framework commensurate with a "second cognitive revolution" (Harré and Gillet 1994). The former entails a problematic Cartesian discourse of hypothetical internal and individualist mental mechanisms (such as McNeill's "growth point") located somewhere between neuro-

physiology and the embodied agentic person. The latter entails a shift to a discursive theory of mind and a cultural psychology (see Harré and Stearns 1995; Schweder 1991).

Unfortunately, the opportunity to debate these theoretical differences in what might be an emerging paradigm for a more dynamically embodied notion of language has been missed. Instead, the editor introduces the volume by elaborating upon a typology of gestures first presented in his earlier work (McNeill 1992) as "Kendon's continuum," based upon the latter's earlier work. The continuum moves from "gesticulation" to "emblems" to "pantomime" to "sign language" along a left to right axis that also moves from "less" to "more-like" spoken languages. Although a typology such as this can certainly provide a useful heuristic device for a new sub-field, this one already appears to have outlived its utility, since research already shows that these basic categories no longer hold. For example, Plains Sign Language (Farnell 1995; Taylor 1996; West 1960) fits neither the category of "gesticulation" (because speech is not obligatory), nor, according to this typology, is it a true "sign language" because "to produce signs [from a sign language] and speak simultaneously ... has a disruptive effect on both speech and gesture" (page 2). While this may be the case with deaf sign languages, Plains sign talkers regularly sign and speak at the same time without difficulty (see Farnell 1995a, b).

In addition, the category "pantomime" is highly problematic as a catch-all category for "a significant gesture without speech, a dumb show ... a move-ment ... not part of a gesture 'code'" (page 2). Its use here draws attention to the potential drawbacks that emerge from a narrow focus on gesture, rather than a broad consideration of diverse kinds of movement systems mentioned earlier. Pantomime was originally a genre of Greek theatre. It became the name of a humorous form of English popular theater in the 19th century, aimed primarily at children. In both contexts, pantomime was a highly conventional-ized genre of performance, and movements were certainly part of a 'code' or, in semasiological terms, an "action sign system" (Williams 1982 and 2002). Likewise 'mime' became an European art form with many distinct schools and traditions, each of which articulated, and continue to articulate, distinctive constitutive properties in their movement vocabularies, the structure of phrases/utterances, and performance repertoires.

Sociolinguistic facts about the term 'pantomime' are also relevant here. Connections between pantomime, children, frivolity, and the gestural com-munication of 'primitives' were certainly not lost to many 19th century investi-gators, who applied the term in a highly derogatory fashion. For example, traveler and author Captain R.F. Burton expressed an ethnocentric contempt for the indigenous languages of America typical of his time:

> A story is told of a man who being sent among the Cheyenne to qualify himself as an interpreter, returned in a week and proved his competence; all he did however was to go through the usual pantomime with a running accompaniment of grunts (1861: 123, cited in Farnell 1995: 36).

McNeil's elaborations of this "basic" continuum compound the difficulties. For example, he offers a second continua which considers the "presence or

absence of linguistic properties," in which gesticulation and pantomime are categorized as "not conventionalized" and deemed to "lack all linguistic properties," *based on traditional notions of spoken language structure*. A residual hegemonic influence from traditional concepts of segmentation in spoken language structure thus provides the defining criteria for whether gestural signs are, or are not, "linguistic." In fact, McNeill considers gestures and language to be made up of contrasting kinds of semiotic properties (a third continua) and they are characterized in oppositional terms. Gesture is "spontaneous, global and synthetic" whereas language (spoken and signed languages) is characterized as "linear, segmented, and analytic." It is not clear to this reviewer why gesture should be considered any more "spontaneous" than speech, but this much repeated characterization seems to be the result of questionable assumptions about the idiosyncratic structure of co-expressive gesture.

A concept of "segmentation" is, of course, largely a function of having an adequate transcription system. Alternative approaches to movement analysis have shown that action signs of all kinds, including co-expressive gestures, are indeed segmentable, and exist within conventionalized hierarchies of structural as well as socio-cultural constraints, but these are not necessarily segmented *in the same way as* spoken languages (cf. Farnell 1994, 2000; Kaeppler 1972, 1985; Williams 1975, 1995). In many action sign systems, including gestural systems, kinemic components are frequently enacted simultaneously rather than in linear sequential fashion, as is the case with speech.

That these classifications and categories are articulated in the introduction to the volume is misleading, since they constitute McNeill's position and those of his former students (e.g., Kita, Duncan, Furuyama) rather than views held by many of the other contributors.

Part 1 of *Language and Gesture*, "Gesture in Action," contains six papers that discuss gesture as part of social interaction. John Haviland expands upon his earlier research to present a rich comparative study that contrasts deictic (pointing) gestures by Tzotzil (Mayan) speakers and Guugu Yimithirr (Australian) speakers. He notes that in the latter there is considerable spoken language support for directional precision in gesture because of the obligatory use of cardinal direction terms in all kinds of GY talk. In contrast, Tzotzil speakers rarely use spoken directional terms in ordinary conversation and have fewer lexical and grammatical resources for talking about the cardinal directions. Nevertheless, they too maintain detailed and precisely oriented local geographical knowledge, employing gestural space to talk about it.

In searching "for the conceptual support that using such spaces might require" Haviland turns to the problematic notion of "mental maps." This unfortunately traps him in a neo-Cartesian discourse in which (externalized) carefully oriented gestures "display" an (internalized) mental representation, and so gestures are reduced to "fleeting but accessible cognitive exhibits" (page 39). In this unnecessary move, Haviland bifurcates the act from its meaning. "Gesture space" *itself* is not the locus of discursive meaning, but merely a "metaphor for these conceptual tools"; "a vehicle for *externalizing*

onto the body and its surround *calculations* of place and spatial relationships" (emphasis added), which, presumably, exist in some mental realm apart from the meaningful gestures. This dualist discourse unwittingly denies gestures the status of dynamically embodied knowledge. It inadvertently undermines the basic premise that "gesture is part of language" because it limits the body to its Cartesian status as a mind-less, unconscious repository and mechanistic operator of practical techniques, a position I suspect Haviland would not want to endorse, since his own research offers definitive evidence to the contrary.

In chapter 2, Adam Kendon presents a semiotic and communicative perspective on the question of whether gesture is a part of language, presenting data primarily from video recordings of naturally occurring Italian conversations. He makes a convincing case for a functional continuity between speech and gesture, showing how utterance meaning is achieved through their co-presence. He considers both to be modes of symbolic representation that achieve meaning in ways that differ. Kendon uses his data to shows how gestures can reduce ambiguity and contribute to the propositional meaning of an utterance as well as serving several pragmatic functions (e.g. as markers of a speaker's attitude; expectations about how an utterance will be dealt with; the nature of the illocutionary intent; as a way to accomplish more than one speech act simultaneously). He concludes that "the way gestures are composed as semiotic forms is very different from the way spoken words and phrases are composed" and this fact should not surprise us since they are "two modes of expression that employ different media which have different possibilities" (page 61). He argues that since gesture and speech in conversation serve different but complementary roles, gestures do not develop spoken language-like features so long as spoken language is used in conjunction. This does not eliminate extensive conventionality however (c.f. Farnell 2000). When gesture is used routinely as the *only* medium, however, it rapidly takes on organizational features that are very like those found in spoken language. Ironically perhaps, in this manner, Kendon presents a far more convincing account of speech-gesture relationships than that outlined by the editor's introduction under the banner of "Kendon's continuum."

In Chapter 3, Asli Özyürek demonstrates the influence of addressee location on spatial talk and the direction of representational gestures in an experimental context. While his findings would not surprise anthropologically oriented scholars, they have implications for theories of "cognitive processes underlying gesture and language use" since they illustrate that "gestural expressions do not represent spatio-temporal representations by a one-to-one mapping onto how images are encoded," they change depending on accompanying speech and spatial context.

In Chapter 4, Charles Goodwin presents a fascinating in-depth analysis of the way in which an aphasic American man, able to use only three words (Yes, No and And) plus limited gestures, is able to contribute to complicated conversations with family members. He embeds his gestures creatively in the talk and action of his interlocutors in a multi-party participation framework organized so as to constitute a common focus of attention. The chapter's focus on socially organized interaction for the genesis and accomplishment of meaning provides

convincing evidence for the explanatory power of social rather than psycho-logical motivation for the symbiotic relationship between talk and gesture. Goodwin's research thus successfully challenges McNeill's account of the conjunction of talk and gesture as "evidence of particular kinds of psychologi-cal processes within the mind of the individual producing the gesture (i.e. the genesis of an utterance within a growth point that is subsequently given shape in different ways by at least two semiotic media: language and gesture)" (Goodwin, page 87). Goodwin's excellent analysis builds on his own earlier work, illustrating how the webs of meaning implicated in the organization of gestures encompass features of their environment as well as historically struc-tured representations of many different kinds, such as maps, images, graphics, and computer screens which provide access to worlds beyond the immediate situation.

Chapter 5 by Nobuhiro Furuyama presents the results of an experiment in which the relationships between gestures and speech of learners and instruc-tors of Origami were examined. Furuyama pays attention the frequency and conditions under which collaborative gestures were present. This represents a welcome expansion of the experimental context beyond the (over) use of stimulus-elicited narrative re-descriptions of scenes from an animated cartoon.

In chapter 6, Le Baron and Streeck broaden the scope even further by exam-ining processes of symbol formation and use within communities of practice in which gestural representations in conversations are abstracted from hands-on interaction with things. They thus position their study outside a conversational framework that privileges speech, and within settings of material practice, in which "...the participants' hands are involved not only in symbolic actions (as they are in conversation) but also in practical actions with things" (page 120). Their analysis of activity rich and cognitively complex settings such as a do-it-yourself workshop and an architecture classroom exemplify "the step by step process by which embodied–manual–action in the world of matter and things may be transformed into symbolic action" (page 130). They illustrate how conversational hand gestures frequently emerge from exploratory and instru-mental manipulations. Hand configurations and movements initially used to hold and use a tool become symbolic when the instrument is not literally handheld, but its use is implied. Such hand configuration and movement 'as if' holding the tool subsequently indexes the earlier action for participants, and thus gestures turn into socially shared symbols that constitute shared knowl-edge in a 'community of practice' (page 130).

Le Baron and Streeck ground their approach in the anti-Cartesian philoso-phy of Condillac, who saw signs as symbolically "transformed sensations" or what nowadays we might call embodied experience. This is similar terminol-ogy, but somewhat different from, Suzanne Langer's concept of ritual and art as "the symbolic transformation of experience." She saw artistic and ritual acts as being expressive in a logical sense, and so quite different from self-expression in the sense of completing the natural histories of feelings (1951 [1942]: 49).

Part 2 of the volume, "Gesture in Thought" focuses on the topic of language and mind from the perspective of cognitive psychology. The principal concept underlying papers in this section, the editor tells us, is that "the linguistic code and gesture imagery work together as a single system." (page 139). An unquestioned assumption is that gestures necessarily involve mental "imagery" of some kind, although the ontologial status of such imagery is not discussed. Utterances are viewed as having two sides — speech and "imagery, actional and visuo-spatial," (page139). The ensuing problem then becomes one of accounting for their integration. The emphasis is on the "mental processes *in* individual speakers and listeners, thereby adhering to a traditional "inside/outside" dualism, (which is brushed aside as merely complementary, rather than theoretically problematic). In part 2, we find papers espousing two different theories of speech-gesture integration (McNeill and Duncan; Kita) as well as speech-gesture timing (Nobe); gesture production during stuttered speech (Mayberry and Jaques); speech-gesture in the grounding of reference (Levy and Fowler) and the ontogenesis of speech–gesture integration during the one to two word period of language development (Butcher; Goldwin Meadow).

Papers in Part 3, "modelling gesture performance" by Krauss, Chen and Gottesman, and de Ruiter continue the aforementioned errors of the first cognitive revolution in assuming that computer like information–processing models are adequate as models for speech, only now we have gesture added. In principle such models are incapable of incorporating contextual information and so fail for speech as well as gestural utterances. Once again we find the reduction of language to a model intended to be realizable in neurophysiology, but fraught with problems (see Harré 2002).

Part 4 "From gesture to sign [language]" raises questions about the relationships between gestures and sign languages. Scott Liddell, a leading scholar in American Sign Language research, examines deixis in ASL. Jill Morford and Judy Kegl describe the remarkable development of a new sign language in Nicaragua that emerged from 'home sign' systems in the 1990's during natural contact between Deaf people who had previously been isolated. To this historical dimension, the closing chapter by pioneer William Stokoe adds a phylogenetic one, in which he proposes that *Homo Erectus* crossed the symbolic threshold, making the move from instrumental action to symbolic representation (not unlike that described by Le Baron and Streeck), and into the elaboration of representations that become increasingly language-like while still in the visual-kinesis modality. Stokoe does not claim that "gestures evolved directly into a (sign) language, but that gestures, as easily manipulated representations of things and actions seen, could have provided the material needed for the cognitive abilities to evolve." Stokoe thus returns us full circle to an ancient idea that first stimulated the study of gestures within anthropology — that language may have begun with gestural expression. But Stokoe combines it with new knowledge about evolution and human physiology, and cognitive functioning, to present some radical but intriguing notions. Coming from this remarkable pioneer of sign linguistics they are ideas worthy of more than a second look.

Endnotes:

¹ For a more detailed history of the study of gesture see Kendon (1997).

² Interest in tool use and gesture continued to play a significant role in accounts of the evolution of human intelligence, however (see Gibson and Ingold 1993). Renewed interest in gesture and the evolution of language is found in Armstrong, Stokoe, and Wilcox (1995); on the evolution of gesture, tool use, and language see Ambrose (2000).

³ Franziska Boas (Boas's daughter) in a personal communication to Jay Ruby. Cited in Ruby (1980).

⁴ Labanotation is a script for writing body movement well suited to anthropological research. It can be likened to the International Phonetic Alphabet for spoken transcription. Pioneered in anthropological contexts by Williams in 1975, it is used by Kappler, myself and others for transcribing human movement of all kinds. It is quite distinct from Laban's effort-shape analysis, a largely ethnocentric classification of dynamic movement qualities that was used in Lomax's Choreometrics project (see Williams 1972; 1991 and Keali'inohomoku 1976; 1979).

⁵ Using filmed data, Birdwhistell applied a linguistic model, attempting to identify movement units based on contrastive analysis. Unfortunately without the theoretical means to specify how bodily movements could be made finite for analytic purposes, and minus the concepts of 'action sign' and 'sign system' that would later provide suitable units of movement and a concept of 'structured system' (Williams 1975), Birdwhistell's analysis tended to dissolve into micro-analytical minutia from which he seemed unable to emerge. For similar reasons, Birdwhistell's attempt to devise a movement transcription system was unsuccessful.

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