WORDS AND GRAPHS
Terminology and Notation for Sign Language Movement

Terminology

When George L. Trager saw the manuscript of *Sign Language Structure*, he had been President of the Linguistic Society of America, had published *Studies in Linguistics* for several years, and was author of the article "Language" in the *Encyclopædia Britannica* (1950s Edition). My monograph about the signing American deaf people used as a language would cause him, I said, to revise his definition of a language.

His reply was that more evidence was needed before he could agree that the primary symbols of a language need not be vocal, but he was intrigued by the possibility that there could be a language without speech, and he agreed to publish the monograph as SIL: Occasional Paper 8. In the years since its publication in 1960 a great deal of evidence has been found that visible activity can constitute the primary symbols of a language. A key finding, by Supalla and Newport (1978), was that previously unnoticed differences in movement clearly distinguish nouns and verbs in American Sign Language [hereafter, ASL]. Many sign languages with the essential structure required of any language have since been described (see Carmel 1992 and 1994).

These "primary sign languages", as Adam Kendon (1988) terms them, are for most deaf people their first or only language; they differ from "alternate sign languages", used by people who can hear and have a spoken language they can use. A large literature on both kinds has accumulated in the course of a single generation. The quarterly journal *Sign Language Studies* began publishing in 1972, and lately other journals have been accepting linguistic, psycholinguistic, and sociolinguistic studies of sign languages.

Interest thus created has led to the discovery and republication also (most notably by Harlan Lane [1984, 1989] and his colleagues), of a long neglected literature about sign languages, some of the most interesting of it written by members of a class of educated deaf people who appeared and flourished after the Abbé de l'Epée in France and his disciples all over Europe began teaching with visible signs. This class of articulate, literate deaf people all but disappeared after proponents of "oralism" (instruction of the deaf by speech alone) drove the use of visible language out of schools for the deaf (see Baynton 1995 for more complete discussion).

There is a large literature about sign languages (e.g. Lane and Philip 1984), but because few were willing before 1960 to consider a deaf community's

signing as genuine language and to write about it as such, the emphasis has largely been on the problems of educating deaf persons in the spoken-written language of the writers--not on the structure and linguistic nature of a sign language. There is also a problem of terminology.

Because of the difference between speech and visible signs and between hearing and vision, the writer on sign language confronts a dilemma: does one use traditional linguistic terms that fit the material badly? One hesitates to call another country's sign language a foreign "tongue". Even the word *language* derives from Latin.- *lingua*, 'tongue'. Charles Hockett (1978) sug- gested sign languages be called "signages" but the term has not become cur- rent. Similarly, my own decision to name the parts of a sign language sign (roughly equivalent to a word) by their function has mercifully not been picked up. I called the active aspect of a sign (the hand or hands) the "designator" (*dez* for short), and identified its action as "signation" or *sig*. In the same manner, the location of the action or place it reached is called "tabu- la" or *tab* (Stokoe 1969; Stokoe, Croneberg and Casterline 1965 and 1976).

This terminological infelicity may have been the cause of a wrong turn in the analysis of sign languages, which use visible instead of mostly invisible vocal movement. My initial analysis of a sign convinced me that its "parts" were not really like the parts of a spoken word called 'phonemes'. Phonemes do have a more or less independent existence; for example, those composing the word *stop* can be re-ordered to produce *tops, spot,* and *opts,* But *tab, dez,* and *sig,* as I termed them, are not analogous to segmental, sequential phonemes. When an American deaf person signs meanings like 'stop', 'school', 'prove', and 'money', the fingers of the two hands are configured identically: the hand is flat, its fingers aligned not spread. The contrasts that make these signs four different words are partly in the movement and partly in the way the hands are held just before being moved--it would be impossible to move the hand(s) first and then arrange the configuration as the sign requires. In fact, because a sign is movement, to analyze it one can only imagine what the movement would look like independent of what is moving, and what the moving part would look like if it were stationary--which of course in signing it seldom if ever is. For this reason, I have always insisted that signs cannot be analyzed into segments, but their composition must be considered aspectually. Aspects are what one sees when one looks at *the same thing*, a movement, in different ways.

More is involved, however, than a new terminology. The literature since the late 1970s has referred not to aspects but to "parameters" and called them handshape, movement, and location. Then, when the location of a sign was a

part of the signer's body involved with the beginning or ending of the movement, the investigators wanted to specify not only what body part that was but precisely how it was acted on. Did a moving hand's palm or back or edge or one or more of its fingers touch the other object? And if the other hand was what was touched, did the back or edge or palm receive the touch? And so on, in more and more detail. Hence, new terms were introduced for talking about components of a sign--which actually is a unitary, minimal physical action, a movement. To handshape, movement, and location were added "orientation", subdivided into "point of contact", "contacting part", "part contacted" (palm, edge, finger, etc.).

Robbin Battison, one of the ten collaborators listed by Klima and Bellugi in *Lexical Borrowing in American Sign Language* (1978) has looked very closely at "handshape" as actual phenomena, what participates in sign language movement. He has found that:

- A manual sign's movement may be made by one hand or both.
- A single active hand is normally the right hand if the signer is right-handed, but rhetorical or other considerations can over-rule this.
- If both hands move, they show the same configuration and move identically or alternately.
- When one hand is the unmoving target of the moving hand, it will have a less elaborate (as linguists say, "less marked') configuration than the moving hand (Battison 1978: Chapter 2).

Those who dissect the movement of a sign into smaller and smaller sub-units, however, have not observed the original aspectual approach; namely, that a signing hand and its movement and what moves, can be separated only by an act of imagination. The handshape aspect is what the hand would look like if it were not moving--but it is. And the action aspect is the movement imagined as if it existed apart from the hand or hands moving--which cannot occur either. The structure of a sign language sign thus came to be viewed by some not as a way of viewing a physical action but as an engineering problem having five or six or seven "parameters" along which different 'values' could be determined. Confusion became inevitable, because so much splitting and re-splitting of a unitary movement violates "Ockham's Razor" (*Essentia non sunt multiplicanda praeter necessitatem*) i.e. 'No explanation should be more complicated than necessary'.

The way out of the discomfort of *tab, dez,* and *sig* as terms was not to keep adding to this triad but to simplify, to eliminate what was not necessary. Only two aspects of a sign language word function (and are needed) to identify the word uniquely. They are two kinds of movement. The first is not usually

recognized as movement, but of course, muscles in the trunk, arm, and hand must have acted in order to give a distinctive appearance to the hand or hands that will be moving. To exemplify: if a signer of ASL strikes the forehead with the fingertips of the bent hand, the message transmitted is 'I know it'! If the striking hand is a fist and the striking movement is equally abrupt, the message is 'How stupid of me'! The second kind of movement is, of course this striking, touching, swinging, lifting, and any other movement seen actually as movement. Movement of this kind is variable within very broad limits; the movement configuring a hand or hands is much more tightly constrained by anatomy; yet the same muscle sets may be involved in both kinds.

These two kinds of movement are, I believe, the minimal units of the physical manifestation of the manual signs of sign languages, and also of manual gestures generally. But the first has seldom been recognized as movement; it is usually described instead as something static; e.g. handshape. The second kind of movement has usually been analyzed by mapping the movement path onto the orthogonal axes of three-dimensional space. As a result the analysis moves into the abstraction of geometry and away from the social, meaning-creating component of body movement.

By ignoring the movement that configured the hand, the analyst has to account somewhere else for the difference in whether the arm to which the hand is attached is bent at elbow or wrist, rotated at elbow or shoulder; and adducted or abducted (i.e. held across the body or forward or to the side). Hence the proliferation of terms to describe the "orientation" of handshape. But when the handshape has been formed and immediately moves, any interaction of it with something else (wherever that is located) is an inevitable result of the movement.

This two-stage neuromuscular activity parallels of course the essential, two-part structure of predication (see also Stokoe, 1991; Armstrong, Stokoe and Wilcox 1995: 161-197). Most would agree that the basic structure of language is grammar and that syntax is at the very heart of grammar; but these terms are interpreted in many ways.

The position taken here is that the very beginning of language occurred when primate creatures of long ago (represented by fossils or not yet discovered) found that their movements actually symbolized the union of something capable of acting with what it did. For example:

a leopard pounces on an antelope :: one hand grabs the other[1]

Such manual movement can simultaneously represent the creature that acts (by pointing at it or mimicking some feature of it) and represent the action (with similarity of speed, direction and terminal action). This typical manual movement, as a sign for something else, no longer appears as some would have it, a clumsy and imperfect nonverbal 'gesture' substituting unworthily for "verbal language" expression. Instead, it can be seen as the prototypical instance of language—a visible sign that shows what acted, what it did and that the two are directly linked in that relationship.

Signing and Education

Another source of terminological confusion in writing about sign languages is a pernicious kind of bias. It arises from the vested interest of key persons in educational establishments, sites where many sign language researchers first encountered sign language, in limited use for instruction or more often in the interactions of deaf students in their free time. The Byzantine plotting and actions that oralist educators engaged in to banish signing completely from deaf education (see Lane 1984) were supported by their outrageous lies to outsiders about sign languages. The way these oralists characterized signs, signing, and signers may well have colored the present connotation of words like *gesture* and *gesticulation* and *primitive,* and terms like *nonverbal communication, animal-like,* etc. when they are used in discussions of language and sign systems.

Language study, linguistics itself, has failed to bring clear distinctions to writing about sign languages. Linguistics in the New World was guided early in this century by cultural anthropologists like Boas and focused on the actual speech habits of peoples encountered. But linguistics, like its much earlier manifestation, the study of grammar, developed only after the invention of writing made it possible to deal more easily with something that normally appears (or sounds) and vanishes (see Farnell 1994: 937-946; 'Movement Literacy').

Writing (a conventional language) is a way to record part—but only part—of the social interaction taking place when speakers use language. Thus a part (perhaps the larger part) of what occurs in real interactions is left out of written language. The omission immeasurably simplifies the task of analyzing (spoken) languages; grammarians and linguists feel comfortable about ignoring (if they even think of it) all that does not appear in the printed or written text. Anthropologists who focus on actual interaction in real-world cultural settings, however, are allowed no such relief from the difficult task of analyzing significant movement.

Our familiar western convention of writing alphabetically--one grapheme representing approximately one phoneme--fails to capture any of the important non-vocal movement of persons conversing, whether it is manual, facial, ocular, movement or shifts in position. But some of what people actually say when they speak to each other could be captured when carving, engrossing, incising, and writing were invented, and so writing became, because it leaves a record that can be referred to, the major way to think of "language".

Grammar, philology, and linguistics, in that order, are the direct descendants of writing. The scribe's work and later the printed page conferred on grammarians' and linguists' examples an authenticity they would not have had in any live, real-world setting. Linguistics also sanctions, in its very name, an ancient terminological tradition--linguistics was coined from the Latin, *lingua*, 'tongue'. But the tongue's movement is just one of the complex movements of the so-called organs of speech. *Lingua* has become the name for far more than that limber organ in the mouth: the terms *tongue, langue, language* imply that language is speech and speech is language--exactly what the study of sign languages shows that it is not. The term *langue* calls to mind the division Ferdinand de Saussure saw between *parole*, the way people actually speak, and *langue*, the overall system they are following or, it may be, departing from as they speak.

Speaking can be defined as a way of forming words from sounds produced by movements in the vocal tract. Signing is also a way of forming words, but directly, from visible movements. "Signing" or just "sign" is short for 'sign language' or 'a sign language'. But "speech" is a short form also; it really refers to 'spoken language' or 'a spoken language', because there is much more to a spoken language than just speech, just as there is more to a signed language than its signs or words. Behind or beneath the audible speech or visible signing are the concepts--those that can be exemplified with nouns as names for things and verbs as designators of actions; but also higher-level concepts; for instance, that a two part sign not only represents a noun concept and a verb concept but also their intimate relationship as actor and action. This description of the parallels and differences between signed and spoken languages should not be confusing, but so many different labels are put on language and its elements that we are confronted with two sets of terms that sometimes refer precisely to these differences and parallels but more often lack clear reference to the fact that audible signs and visible signs may be equally valid alternate ways of expressing what a language expresses. Thus we have referring to speech languages:

oral, spoken, vocal,
verbal, written, audible,
audition, linguistic, language,
tongue, speech, articulation

And when we turn to writing about sign languages, we find another somewhat equivalent set:

manual, signed, gestural,
gesture, recorded, visible,
vision, non-verbal, sign
articulation (but not of the same parts) ...

Attempting to put some order into this confusion of tongues may be as frustrating as trying to restore the Tower of Babel but still an attempt worth making. To begin with single nouns seems a logical first step, but it is often the unmodified, unqualified nouns of a language that refer to the broadest abstractions. However, at the start there is no antithesis: whether it is spoken or signed, Language is language--whatever language is. (John Lyons entitled a lecture at Cambridge in 1977, "What is language?" and began by saying he would not presume to say what language is. Derek Bickerton in 1995 is less diffident; he names his first chapter, "What language is").

To refer to the language of 99.9%			To refer to the language of 0.1 %		
In common	OK	Incorrect	In common	OK	Incorrect
language			language		
linguistic			linguistic		
	speech			signing, or sign	
	spoken			signed	
	vocal			gestural	
	auditory			visual	
	written			recorded[2]	
	audible			visible	
	audition			vision	
		*oral			*manual
		*verbal			*verbal
		*nonverbal			*nonverbal

The table above offers a number of suggestions for usage in the hope of reducing confusion. The table format shows that there is both similarity and

difference to be accounted for and accurately designated in writing about language and languages. It bears repeating that both spoken languages and signed languages are *languages,* and that *linguistics* has, or should by now have, sufficient scope to include both.

In the next row, speech and sign, as has been noted, are convenient brief forms. The terms in the next two rows refer of course to the mode of production and reception of the words and sentences of each of the languages in question.

In the seventh row there is nothing on the right, sign-language, side precisely equivalent to writing, and of course there has been no equivalent of phonetic transcription, both because sign languages were for so long denied status as languages and because they do not use phonemes. Below *written/recorded* in the table the terms *audible* and *visible* need no further explanation; but those who study sign languages need to be familiar with Kimura's *Neuromotor Mechanisms in Human Communication* (1993). Neuromotor mechanisms involved in producing speech output are not as different from those for producing sign language output as narrowly focused clinical accounts of speech, aphasia, and hearing have made them appear. Moreover, as Kimura points out, the brain centers that time and coordinate vocal tract gestures and larger gestures are in the same or adjacent parts of the brain.

The pairing of *audition* and *vision* even more urgently points to the need for those who write about sign languages to gain more state-of-the-art knowledge about the brain and its role in sight and hearing as well as in the timing of coordinated muscular activity. But this need is not one-sided; those who write about spoken languages are often guilty of assuming more about how speaking, hearing, and language are related and about what might be lodged in the brain than could possibly be true. For instance, the assumption is made, without confirmation from neurophysiology, that the sensitivity of the auditory system to differences in sounds is a foundation of language. Yet parrots can imitate a stretch of speech, even a particular individual's pronunciation, more precisely than can a human speaker. And the number of neural linkages between the two retinas and brain is many orders of magnitude greater than those between the two cochleae and brain. Anything as complex as a language would seem to have needed the richer complex, not the more meager neural network.

And now to look at the bottom right side of both columns in the table: I have starred all four of the terms, because in my opinion it is almost impossible to use any of them correctly. They just don't fit the case. First, *oral* (from Latin *-oris*) is an adjective referring to the mouth, but it is often used, espe-

cially in writing about education of deaf children to distinguish spoken from signed languages. What makes the term imprecise is that the mouth is only one of many body parts required for speech. Linguists of all persuasions would doubtless agree that speech is initiated (if not created by rules) in the brain, and, would agree also with speech scientists and physiologists that speech sound is air from the lungs set in vibration in the throat and modified as it passes through and issues from the mouth, and/or nose. Thus, their use of oral for spoken languages gives undue weight to one of the two possible ways that language is produced.

The adjective *manual* is equally and for a parallel reason objectionable; sign language utterances also are brain-directed (or created) and the hands, like the mouth, are only one part of the complex neuromotor mechanism that makes languages utterances visible or audible. Some of the most important signals in a sign language--e.g. those that indicate whether a question is being asked or not and if so what kind of question (See Baker-Shenk 1983)--are not made manually, by the hands, but with facial and other movement. If all who write about languages would stop using the terms *oral* and *manual* loosely, the intellectual climate would surely improve. As aforesaid, language is language, and speaking and visible movements are two ways it is transmitted and received. It would be well if *oral* and *manual* ceased to be used in this context--though that is unlikely; but they are imprecise and loaded with all the baggage, and baggage trains, of the centuries-old war between oralists and those who knew that speech is not the only way language can be made manifest.

Finally, the terms *verbal* and *nonverbal* (or *non-verbal*) ought also to be put off limits to those who write about language, sign languages, or gesture. The expression "verbal language" is both redundant and a sign of ignorance. The Latin *verbum* (i.e. 'word') refers to a unit of a language. Hence, all languages are verbal, because they are composed of words as well as sentences. If something is verbal it is, or involves, language. Consequently, the term is quite out of place when used to distinguish spoken or written language from signed language. *Nonverbal* is thus doubly incorrect when applied to any language, but its use to characterize communication is equally suspect. When a speaker accompanies speech with gesticulation or gestures (here, too, better terms are needed), it is incorrect to say as many do that the accompaniment is nonverbal. Adam Kendon (1991) and David McNeill (1985; 1992), among others, have shown that both the audible and the visible actions of the speaker are expressions of the same conceptual scheme, for both are verbal, i.e. language-

based (see Williams 1991: 182 for a recent expression of this. See Williams 1976a and 1976b for origins of the usage 'non-vocal' in semasiology).

Underlying the proper use of terms is the fact that human upper-body movements are homologous with and have evolved from similar movements of other primates. In the process of evolving--from serving non-human gesturers to serving human gesturers--something happened to these movements, of course. This was the advent of language, which continued to use these visible movements for transferring social information, but used them as higher-order signs (i.e. sentences) that uniquely embody syntax. For when it was seen that a moving hand resembled something else and its movement directly indicated what that something else did, syntax and language became part of cognition--*human* cognition. Chimpanzees can be taught to make gestures very similar to those made by a signer of ASL and even to use the gestures appropriately in many situations. Chimpanzees cannot, however, so far as has been shown, take sign sentences apart and deliberately use the parts to make new sentences that might be appropriate in other, hypothetical situations.

It might seem that the term verbal could be applied to such gestures as chimpanzees have been reliably observed making, but there is an objection to this: "verbal" means pertaining to words; and words are not just signs for discrete or isolated concepts. Words by their nature are, as the old (and inadequate) term has it, "parts of speech." In other words, a word is an integral part of a language; it is not just a name for a thing or person or quality or action or manner of acting; it also is in itself both the product and producer of syntax. If something is a word, it is also has a syntactic role and syntactic as well as a semantic reference. Whatever a word "means" it must also be a noun or a verb or a member of another word class. And if the form (spoken or written or signed) of the word in isolation does not immediately identify its class, its use by a native user of its language makes clear that the user knows perfectly well into what classification it fits.

The present complaints and suggestions about usage may appear to be just another attempt to combat imprecision in the use of language. Such complaints are futile: people use language as people do. I once objected that a celebrated writer on evolution misused 'decimate' to describe the extinction of a species. He replied, correctly, that the majority of users of the word, as determined by current dictionary editors, now use it to mean 'wipe out' and not, as formerly, 'execute one man of every ten' in a Roman legion that had shown cowardice. But the case here is not at all parallel. Of course people will continue to use language the way people do, and woefully uneducated but pro-

fessionally qualified teachers of our deaf children will continue to write, albeit unpronounceably, about "aural-oral" language training when they mean attempts to make children who cannot hear tolerate the noises from their hearing aids or implants and guess what speakers are saying by watching their faces. And unfortunately there will be much more written about "nonverbal communication" when it would be more enlightening to describe accurately what is happening during face-to-face communication.

Notation

In addition to confused terminology and the confusion in thinking it reveals, research on sign languages of deaf people has been vitiated by the absence of a satisfactory means of indicating well-established analysis, an accepted system of movement notation. Brenda Farnell in several publications (1994, 1995a, 1995b), points out the inadequacy of word glosses for significant movements and presents a strong case for the use of Labanotation by sign language researchers. I agree in general with Farnell about the limitations of words, drawings, photographs and film, but I would like to explore further the problems inherent in the notation of body movement and its communicative potential and use.

While notation systems can be useful in exploring the social uses of movement, I firmly believe that more than a notation system is needed to do for sign languages all that writing and phonetic transcription have done for spoken languages. This is not to minimize the power of Labanotation but to recognize that between the time when a small priest-caste could make and decipher inscriptions and the time when literacy is universal or nearly so in some nations, several thousands of years had to elapse--and inevitably the notation system changed over those centuries.

It must be recognized that the two basic forms of language, speech and sign, are separated by what Hockett (1978) calls "syntactic dimensionality". Alphabetic writing and the added precision of the IPA (International Phonetic Alphabet, with all its diacritics) are feasible and practical, respectively, for the writing and notation of speech, which varies only in the dimensions of sound. But the difference between sign and speech is precisely the difference between our world and the world so enticingly described in Edwin Abbott's *Flatland*. A single line of symbols across a sheet of paper can record one speaker's output of consonants and vowels (grouped as separate words)--just as a single staff, with its vertical provision for two octaves or more, can record a melody (Note that four such staves are needed for a quartet). But what a user of a sign languages does with hands, arms, face, eyes and mouth and

more are movements in the three dimensions of space plus time. Because the world of vision and the world of sound are differently constituted, reduction of a language utterance to the two dimensions of a sheet of paper will inevitably lose information--just as a written transcription loses something of what the live speaker said and did.

Isometric and perspective drawings by convention represent three-dimensional objects on paper, but these objects are stationary; a signer's body during signing is constantly moving, changing its appearance. Thus drawings and photographs fail to do more than imply movement.

Twentieth century technology--beginning with arc-lighted motion pictures and presently toying with "virtual reality"--has made it possible to record with ever growing fidelity the movement of a signer of a sign language. Or a dancer or troupe of dancers. Film and videotape have been very useful for the study of sign language. For example, long ago it was while viewing 16mm film running faster than normal through a projector that it became apparent that American sign language statements end with the arms relaxed and the hands touching each other or another part of the body, but questions end with arms extended toward the one addressed. The current techniques of digitalization of images and computer-based retrieval can possibly lead to other significant discoveries about how signing works.

The great advantage of Labanotation as presented by Farnell is its capability of graphically representing movement as large as a leap in the air and as small as crooking a finger; but for recording the flow of a narrative, this capability, because of the great number of graphic symbols and conventions for using them that it provides, may be an impediment. Perhaps the basis of this apparent paradox is not the notation system itself but our anthropocentric world-view and science. In a very general sense, all movement is change, and change is the source of information. In human societies, however, some kinds of movement have been given more attention than others. This discrimination has led to a further separation--between the kinds of activity that have been categorized inaccurately and inappropriately, as 'verbal' and 'nonverbal'. This conceptual separation has been easy to maintain, at least in 99.9% of the population, because a large part of the vocal activity (precisely timed movements of largely invisible muscles in the trunk and head) are the producers of audible output, and because larger, visible movements produce what has been called 'gesture', 'gesticulation', 'body language', etc.

In a community of deaf people, however, the ethnographer must try to distinguish movement that is language from movement that is not language. Because there is no difference in channel or mode to mark off such a distinc-

tion, it is possible even to ask whether the distinction is valid. Social interaction generally involves language, but when visible movement itself is language, the boundary between movement occurring with it is difficult to discern. The investigator may well ask whether any of the movement can safely be ignored. In this situation, the ethnographer using Labanotation is able to set down every movement observed and postpone the determination of whether all or only some movements are meaningful and to what degree.

Profound deafness from birth or early infancy affects only about one person per thousand, so it is not surprising that ethnographies of deaf communities are rare. Farnell's work has taken her into an even more unusual situation. The Assiniboine story-telling she describes (1994 and 1995) occurs in a culture that preserves an alternate sign language. Like the sign languages of Aboriginal Australia (Kendon 1988) and of a few African groups, those of the Plains Indians are used by people who do not need them—at least not as deaf people need a primary sign language.

Instead of a culture in which speech and visible movement are more or less clearly separated, or in which linguistic as well as other communication is all visible, these cultures until recent times possessed Stone Age technology. And they routinely use either visible movement or vocal sound as perfectly acceptable alternative means of language production. Kendon's account (1988) suggests that among the Australian tribes the spoken and signed languages are used for different purposes (see also Kwek 1991 and Kendon's introductory note therein).

Farnell has described the use by individuals (with the expectation of being understood by others in his culture) of integrated spoken and signed discourse. Her transcription in Labanotation of the sequence of movement (the sign language) with the spoken words placed appropriately along the time line, makes it possible to understand what the spoken words by themselves are insufficient to convey. Her conclusion, that film and video records "are a place to start doing anthropology" is certainly valid, but as one teases out recurring patterns in these records, it is important (as Chaucer says, "The lyf so short, the art so longe to lerne") to weigh the cost in time needed for paper and pencil notation against the cost of capturing a few frames of video for later scrutiny repeatable at will. It is not clear either to what extent Labanotation will serve for indicating the range of facial expression changes that do have direct linguistic function in ASL (Baker-Shenk 1983). Significant facial changes are not necessarily simultaneous with other movements and therefore require a separate time line in the transcription to show where their

beginnings and endings occur relative to the upper limb movements and body shifts.

Finally, if I may be permitted a word or two about "Stokoe Notation" as it has come to be called. It is cumbersome and non-intuitive[3] and its symbols and conventions may be "longe to lerne" but it has the virtue of having been developed, along with the preliminary analysis (1960), specifically for a primary sign language. It also has the serious fault of totally neglecting the non-manual activity, but as aforesaid, this in any notation scheme requires a separate time line paralleling the notation of other movement.

To improve Stokoe Notation would require making sure that each handshape notation is complete enough so that the matter of orientation (actually the state at each joint from shoulder to wrist) is not left in doubt. The original practice of using subscripts on the major handshape symbols could be extended where needed, though a neutral or unrotated position might continue to be left unmarked if, for example, pronation and supination of the forearm is shown respectively by inverted and normal italic 'a' as subscript. Similarly, an angle marking subscript could indicate the extension-flexion at the elbow, and another, the shoulder rotation and position of the upper arm (at the instant the handshape is formed and the major movement about to begin). But this program is formidable, and unfortunately, virtually all linguists who study sign languages have taken the path of least resistance. They use word glosses for signs; actually, for just those movements that they take to be necessary to form a lexical item of the language under study.

Overcoming this resistance, even with an improved notation system, may not be possible within one generation. I have, therefore, for the reasons explained above, chosen to participate in the development of a multi-media edition of *A Dictionary of American Sign Language* (1965 and 1976) in which QuickTime[TM] movies of actual signing will be connected not only with dictionary entries of the usual sort but also with Stokoe Notation and icons and point-and-click menus showing single frames or brief sequences of movement.

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Notes:

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[1] Read the double colon, i.e. [::], as "is equivalent to" [The Editors].

^{2} Note that this column refers to sign languages that are used as spoken languages. There are, of course systems for movement and dance notation notably Labanotation. None of these have been adopted for sign language writing as alphabetic/phonetic writing has been adopted for spoken languages.

^{3} But intuition varies. I recall that a bright deaf college student coming into my office in the early 1960s asked what "those symbols" on the blackboard behind my desk were for. In a matter of two or three minutes I explained (in speech and signing) what they signified. He stood still for a moment and then going to the board, he began to make signs and write the notation for them.

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