# SIGN LANGUAGE AMONG NORTH AMERICAN INDIANS

# APPROACHES TO SEMIOTICS

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# SIGN LANGUAGE AMONG NORTH AMERICAN INDIANS

## COMPARED WITH THAT AMONG OTHER PEOPLES AND DEAF-MUTES

*by*

GARRICK MALLERY

*Photomechanic reprint*
*with articles by*

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# FOREWORD

The aim of this volume is to make available anew Colonel D. G. Mallery's classic monograph on the Indian sign language of the Great Plains (correlated with that among other peoples and deaf-mutes). This is supplemented by A. L. Kroeber's article, "Sign language inquiry", incorporating a short historical survey, and C. F. Voegelin's note, "Sign language analysis, on one level or two?" The latter two are reprinted from the *International Journal of American Linguistics*, Vol. 24, pp. 1-19 and 71-77 (1958), respectively, both with permission of the editor.

Interest in this subject keeps flickering. This is underlined, for instance, by the recent appearance (New York: Dover) of a corrected version of William Tomkins's book — alluded to by Kroeber — under the abbreviated title, *Indian sign language;* originally published in 1926, this 1969 version is based on the fifth edition of 1931. On-going research is also exemplified by Magnus Ljung's article, on the "Principles of a stratificational analysis of the Plains Indian sign language", which appeared in *IJAL*, Vol. 31, pp. 119-127 (1965).

The single most important work of this century on the Indian sign language consists of the research of LaMont West that resulted in an Indiana University dissertation, entitled *The sign language analysis* (1960). This comprehensive study, based on field work and including an extensive bibliography, unfortunately remains unpublished.

THOMAS A. SEBEOK
August, 1970

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# SIGN LANGUAGE INQUIRY

A. L. KROEBER

## 0. HISTORY OF INQUIRY

The Indian sign language of the Great Plains and surrounding regions attracted much interest in the nineteenth century but has been thoroughly neglected in the twentieth by both linguists and anthropologists.

D. G. Mallery's monograph appeared in 1881 in the first Report of the Bureau of Ethnology as a study of nearly 300 pages. Wm. Philo Clark's *Sign Language* appeared posthumously in 1885, was unillustrated and has become rather a rare book. Lewis F. Hadley, a missionary, produced *Indian Sign Talk* in 1893, which I have not seen.

The present century added a nonscholarly but extraordinarily useful pamphlet, called *Universal Indian Sign Language*, sold primarily to Boy Scouts, published in San Diego by the author, William Tomkins — the fourth edition is copyright as of 1929. I am told it is still to be had from the Fred Harvey Co. affiliated with the Santa Fe Railway in Albuquerque. It is compendious, concise, contains over 400 line drawings, and being written for schoolboys is simple and clear and avoids speculations in favor of information. It contains some loose generalizations of a popular sort, a few transparent errors, but as an introduction I have found it effective and more useful than any of the earlier and more pretentious but less complete books. I have met Mr. Tomkins, presented him before my department of the University, and have every confidence in his integrity and substantial accuracy. His work seems centered on the Western Dakota.

Fearing the sign language might be becoming or even have become moribund, I urged for some years that a field study be undertaken before too late. Carl Voegelin responded most coöperatively and arranged for his student LaMont West to visit Plains reservations in the fall of 1956. West found the system still practiced, in fact in rather wide use on ceremonious intertribal occasions, perhaps as a more appropriate and exhibition-like or entertaining medium of communication than English. The chief modernism was that the executants now duplicate their sign communication by simultaneously speaking the corresponding words. If anything, the sign language seems to

have spread, and West found regional variation to be considerable. He secured film records, and plans to continue field study and write a dissertation on the subject.

Encouraged by this favorable situation, Voegelin and I applied to the American Philosophical Society for a grant to aid first-stage research, for receipt of which we are grateful. It will enable West to continue intensive inquiries during the summer of 1957 with a selected informant, and for both of them to meet with us for review and appraisal in the fall.

The present paper is intended to provide for a twentieth-century pick-up of a topic which nineteenth-century students dropped when they no longer knew how to carry it farther, and which for over sixty years has lain neglected.

Mallery and Clark had much and valuable information on the sign language — much more than I possess. But they were army officers, as Hadley was a missionary, and they did not really know how to make an intensive scholarly analysis of an unusual and novel system. Nor could Major Powell and his associates at the Bureau of Ethnology show them, except with examples of broad speculation. They knew about collecting data — Mallery published a somewhat discursive corpus of fifty pages (479–528) of sign language texts, though another fifty pages (409–459) of illustrative "Extracts from the Dictionary" concern only some twenty sets of meanings. He sensed the value of comparisons, but discriminated less as to their relevance. Mallery's knowledge was abundant and of good quality, his interest was intense, but his day scarcely permitted him to weld his data into a systematized, configurated description: he ran off into free associations instead of persisting in analysis.

Nor am I ready to supply a description — a job of some years. But I hope to outline some twentieth-century perceptions which may prove fruitful and to suggest leads which when developed may contribute to a modern understanding of what the nature of this interesting sign system was.

## 1. MANUAL EXECUTION

### 1.1. *One-hand and two-hand gestures*

The literature is not too explicit on free choice between executing gestures with one or two hands. In a formal situation, such as was probably usual, both hands would be free. Yet there is a considerable group of gestures described or pictured as if they were typically executed with one hand only and another group in which both hands execute the same gesture simultaneously and abreast, like a team of horses. The one-hand signs mostly express single bodily acts, or characteristic animal motions — in general, the momen-

tary; also, they express such approximations to renderings of grammar as sign language expresses. The two-hand or double gestures more often represent plural or iterated acts; in short, the durative as against the punctual, with the doubling giving quantitative reenforcement to the idea, as it were.

However, further study should concern itself with specific inquiry into how far the two classes are really separate, conventionally and mandatorily, or how far it is a matter of convenience or circumstance (or accident of description) to vary between use of one or two hands. While sign language may have been mostly employed on formal and ceremonious occasions, it may also have had some use in situations such as riding, hunting, scouting, where two hands were not free.

These are instances from Tomkins of two hands being used as a team; none are static: *attack* (*charge*), *advance*, *withdraw* (*afraid*), *throw away* (*abandon*), *push* (*try*, *effort*, *must*, *begin*), *seize*, *swim*, *dig*, *bet*, *dance*, *gallop*; *sick*, *palsied*, *cold* (*winter*), *hot*, *tired*, *heavy*, *light*; *bless*, *pity*, *thanks*, *quiet down* (*calm yourself*); *cloud*, *rain*, *snow*, *wind*; *people*, *bird*, *grass*, *coat*.

In *trade* (*exchange*), *blanket*, *ashamed* (*bashful*) the hands move indentically but in opposite direction, crossing. This subgroup may fit in better elsewhere than in the present class of hands paired.

Free single-hand gestures include some few static positions: *I*, *man*, *short*, *stand*.

The single-hand "grammaticals" are: *all* (including plurals of nouns and pronouns), *I* (*me*), *you*, *possession* (for possessive pronouns, also for *have*, *own*, *belong*), *now*, *yes*, *no*, (*not*) and "*question*". This last both signalizes an utterance as interrogative and expresses *what*, *who*, *which*, *why* (slow turns), and, in compounds, *where*, *when*. The interrogative must stand first in its sentence for obvious reasons.

The following are one-hand movements: *live* (*alive*), *rise* (*arise*), *recover health* (same as last, but palm under), *bring*, *go* (*depart*), *come*, *give*, *give me*, *distribute gifts*, *take*, *shoot*, *kill*, *see*, *jump*, *fall*, *twinkle*, *lightning*, *rattle*, *wait*, *stand*, *sit*.

*Defy*, with tip of thumb protruding between index and middle finger, is a Mediterranean and Mediaeval gesture, and was probably borrowed by Indians from whites. It is further out of step by presumably being an "interjection", an expression of emotion to the listener, of which the Plains sign language seems very chary, tending to restrict itself to conveying information.

*Alone*, *another*, *by itself* (*free* [standing]); *near* (*close*), *far* (*distant*), *up*; *man*, *chief* ("rising above"?), *friend* (brothers grow up); *dog*, *wolf*, *fish*, *snake*, *frog* (= *jump*); *sun*, *moon*, *river*, *rapids*, *bluff* (*butte*), *mountain*, *peak*, *tree*; *wheel* (*wagon*).

It will be seen that one-hand free gestures are more numerous than the two-identical-hand ones, and evidently they are used more frequently and importantly in connected discourse.

### 1.2. *Classification of signs requiring two hands*

#### 1.2.1. *Two hands used, but stationary*

*Astride* (*ride, horse*), *baby* (in arms), *beside* (*with, together, unite*), *hang, house, marry, opposite, prisoner* (bound wrists), *saddle, tepee.*

#### 1.2.2. *Two-hand signs, only one hand moves*

*Above, across, after* (*future, behind*), *among, arrive here, arrive there, beaver, before* (past), *below, brave* (standing fast?), *brother-in-law* (meaning? — but sister-in-law is *brother possess wife!*), *cannot* (*impossible,* not penetrate, bounce back), *canyon* (*gap, defile, gorge:* "two sides, pass between") *color* (finger tips rubbed around on back of hand — contrast with "Indian", rubbing with inner surface of fingers), *cut up meat* (slicing), *dismount* (alight), *dive* (under surface), *dull* ("cut not"), *end* (*done, cut off*), *exterminate* (*wipe out:* wipe off palm); *falls* in stream, *few* ("compressed"), *hard* (*stone, metal,* fist against palm), *high, how much* (*how many* = *question*), Indian ( = "like myself in color"? — ct. *color*), *inferior, superior* (in rank or station; same sign for the two, except R index indicates person referred to); *meat* (L hand slices R), middle (R index tip points to L index knuckle), *overtake* (R index forward against L hand), *poor* (in goods: R index tip scrapes L), *powder* (bunched R tips circled just above L palm), *rope* (R index behind L in line, withdrawn spirally), *rose* (R tips pluck at L bunched ends), *run into* (R back hand against L palm); *sew* (R index pushed like awl over L thumb, twisting), *sharp* (L[!] thumb touched lightly against edge of R palm, which evidently represents knife edge), *steal* (R curved hand passed under flat L, then withdrawn while index crooked), *strike with weapon* (count coup? — R hand edge strikes L palm), *thick* (meat, slice: L palm grasped between R thumb and fingers, felt), *tobacco* (R closed hand rubbed around on L palm — obviously to indicate grinding of leaves).

#### 1.2.3. *Two-hand signs, both moving*

1.2.3.1. *Interacting or crossing: all gone* (vertical hands wiped up and down, R back against L palm side), *blanket* (*robe* — closed hands cross in front of chest, as if drawing robe around shoulders), *color spotted, pinto, "off"* (L and R backs of hands rubbed), hold (in, keep out, contain? — fingers overlap to cover interstices, slide gently back and forth); *meet* (raised indexes, downwards, meeting at tips), *mingle* (nearly flat hands lightly touching, moved edgewise in small circles), *miss* (erect indexes pass each other), *mud* (each hand alternately clasps other, dragged off its fingers, "hoof extraction"), *night*

(hands out level, R moves over L, L under, "covering"), *quarrel* (indexes erect, both thrown forward and back briskly by wrist flips); *sign language* (hand backs alternately touched by finger tips of other), *tangle* (fingers spread, point past each other, hands revolve vertically), *trot* (with fists, alternately; animal, fists), *war, fight* (fists in front, alternately forward and back), *work* (flat hands facing, R higher, behind, both moved up and down, as if chopping; nature of specific work not clear).

1.2.3.2. *Bilaterally Symmetric Simultaneous Motion:*

1.2.3.2.1. *Centrifugal: break* (fists as if holding a stick, twisted apart, breaking upward); *clouds* (open hands over head, brought down to side; *gloomy* = *clouds* plus *close*, centripetal), *large, increase* (vertical parallel hands spread apart with little stops), *land* (flat hands down, then spread apart); *mound* (curved level hands up, side by side, spread downward, palms face), *prairie* (flat hands touch, palms up, spread), *soldier* (fists side by side, spread horizontally; origin not clear).

1.2.3.2.2. *Centripetal: heap up* (vertical hands approach, rise, touch), *many, much* (open hands vertical, apart, dropped and then approached), *surround* (spread thumbs and indices brought together).

### 1.3. *Use of body parts other than hands*

Some 90 of Tomkins' signs involve some other part of the body in addition to the hand or hands. Contrariwise, there are no signs recorded as made only with parts of the body other than the hands, such as the legs, feet, or head. *Yes* is said to express nodding or "bowing the head," but it is the hand with raised index that actually is inclined forward. This suggests the strength of the channeling of the system; which is further confirmed by the sign for *sign language:* touching the forepart of the back of each *hand* with the finger tips of the other. Leg motions like walking, running, stepping, dancing, and presumably kicking are represented wholly by hand gestures. Sleeping is basically indicated by a motion of the flat hands into a tandem position; "then incline the head to the right," *as if* to lay it on the pillowing hands. A token inclination would suffice, and was probably the elegant execution; and the illustration shows the head not actually laid on the hands. Most utilization of the head or its parts is without or in very light contact; approach or proximity to eye, ear, mouth, nose, hair, etc. seems to have been favored over touching these. The system of communication might well be called a hand language.

The forearm must perhaps be included with the hands, because the height of the hands above the ground or body is often part of the gesture symbol. But there are remarkably few full-arm movements, either straight or circular: they were obviously avoided if possible. When there is such, the movement is

always accompanied by a finger-hand gesture. Thus *sun* is primarily indicated by the near-circle of index-thumb; but as this appears also in *star, coin* ("*money*"); *medal, watch,* it is specified as *sun* by addition of a semicircular swing of the arm: the little circle of thumb and index is moved over the head from level to level, preferably from east to west. The sign for *another* is badly drawn in Tomkins and looks like an arm swing; but the text is much more modest: right hand over left breast, sweep it up and out toward right, ending with palm up. *Warbonnet* and *tail* involve bringing a hand to the hip or buttocks, but this is merely indicative of the relevant part of the body.

Herewith are listed the Tomkins occurrences of body-part inclusions in signs.

BODY, TRUNK, OR TORSO: *Sick, ache, lean* (*skinny, "poor"*), *hungry, laugh, fond* (*love, hug*); *I* (*me*), *give me*; *another*, [situated] *by itself* (*solitary, only, free* [standing?]); *arrive here, close* (*near*); *push* [centrifugal]; *mother, father* [these are similar taps — "or pluckings" for *mother* — to the left breast, for *father* to the right, and the latter adds the determinative for *man*, which would hardly be needed if the two signs did not unduly resemble each other]; *half breed*; *coat*; *jealous.*

HEART, mainly in metaphors: *heart* (the organ), *good* ("heart level"), *know* (*understand*), *think* ("heart drawn-from"), *remember* (*memory*, "heart know"); *annoy* ("heart flutter").

HEAD, chiefly for horned or long-eared animals, about half of the signs static: *antelope, buffalo, deer, goat* (these static), *elk, mule, mountain sheep* (moving) — these usually call for paired hands; *hot* ("rays pressing down"); *sleep.*

HAIR: *woman* (*girl, female*: "combing" — sideways from sagittal parting of hair); *Crow Indian, Osage* (typical hair-cut); *otter* (fur used for tying or wrapping hair at sides); *mourn* ("cut hair" plus "tears"). The way in which the concrete object is used to express quite diverse concepts is interesting and typical.

FOREHEAD: *hat, white man* ("cap visor"); *angry* ("mind twist"), *crazy* ("mind whirl"), *sacred* (*holy, medicine*, "unknown, mysterious"). These signs evidently indicate the forehead for the brain, and this organ as the seat of feelings, which so far as known is not an aboriginal conception, whereas in modern Western civilization the brain is regularly the seat of the mind. It is possible that these signs were originally made at the heart and then altered to conform to White conceptions.

FACE: *face, ugly* ("face bad"), *beautiful* ("face good"), *paint face, ashamed* (*bashful*, "cover face").

EYE: *eye, see* (*look*), *blind* ("see not"), *tears* (*cry, weep, mourn*), *owl* (big round eyes).

EAR: *hear, listen, deaf*; *bear* (large ears; clawing); *mule* (see head group); *forever* (flat hand back and forth over ear; significance unclear).

NOSE: (*wild*) cat (snub nose); *Nez Percé tribe*; *smell, fragrant* ("smell good"); *blood* (the sign is for nose bleed).

MOUTH: enters into many signs: *name* (*called, speak, talk* — index snapped out); *orate* (*confer, explain* — hand forward from mouth); *tell me* (motion reversed); *true* (*honest*, "one talk"), *untrue* (*lie*, "double talk"), *abuse* (*defame*, "double talk" moving from mouth); *sing* (2 fingers before mouth whirled; Tomkins says the whirl means *all*, but this seems doubtful); *silent* (finger tips over lips); *joke* (hand before mouth moved up; connection not clear; possibly the hand is jumped up. Tomkins: "recognized, not in general use"); *taste* (finger tip to tongue tip), *sweet* ("taste good") *sour* ("taste bad"); *eat, drink* ("from curved hand"); *want* (Tomkins: "give me". The motion shown looks very much like bringing a bottle to the mouth — i.e., "give me whisky"); *astonish* (*surprise*, no doubt also emotional shock, embarrassment — the well-known Indian gesture of hand over mouth. Tomkins says this is the left hand, which probably holds only if the optional accompanying gesture of protest or *halt* is made with the right); *brother* (two finger tips to lips, moved out; meaning not clear; "speaking alike"?); *sister* (Tomkins: *woman* followed by *brother*, whereas the *brother* sign is followed by *man*!).

CHEEK: *red* (rub cheek).

CHIN, THROAT: *beard, goat* (*horns* followed by *beard*), *eaten enough* (*eat* plus index raised across throat), *Sioux* ("cut throat").

EYEBROW: *tweezers* (pluck brow).

ARM: the lower arm serves as a surface on which to repeat slight motions several times: *spotted, striped, tattooed* (appropriate movements three or four times toward hand); *often* (*many times* — little jumps, but upward from wrist); *strike match* (one distal movement).

LEGS: legs are touched for *leggings* and *moccasin*.

SHOULDER: *carry* (hold sack by two hands over one shoulder), *lead* (horse) by rope, *blanket* (draw around shoulders).

BACK: in *warbonnet* and *tail*.

## 2. SAMPLE GROUPS OF SIGNS CONTAINING A COMMON ELEMENT

One way of classifying signs is by assembling all those that contain a common element, such as a fist in motion, a flat hand with palm up, a raised index, signs consisting of three or four identical steps or progresses, and so on. It is then possible to see how the associations of such an element vary, what it is that distinguishes the several "derivatives" from the common "radical", whether the radical carries a common meaning over into the "derivative" compounds or not, and in general to learn more about the principles on

which the sign language was built up and that are significant or not in guiding the execution of signs today.

I present two such assemblages: first, all the examples I found of a very simple element, namely the horizontally extended or pointing index; second a figure rather than a gesture, a near-circle made by touching or almost touching the thumb and index tips of both hands.

### 2.1. *Gestures beginning with index extended horizontally*

#### 2.1.1. *One-handed, or two hands alike*

*Cartridge.* No motion: thumb held close to index, simulating the cartridge in the barrel.

*Alone.* Index moves forward (out) sinuously. The symbolism is not clear.

*True, honest*: "single tongue." Index before mouth, out.

*Bring.* Forearm level, forward; then hand brought back in toward body, index changing from straight to curved.

*Take.* The verbal description seems identical with bring, but the diagram emphasizes the reach or thrust forward and reduces the back-in motion. This may be intentional or merely an accidental variation of the draftsman. It is the sort of point that may be theoretically important, but can be cleared up only by renewed observation.

*Afraid, shrink from.* Extended hand and index are drawn back while index is curved. Can be made simultaneously by parallel hands.

#### 2.1.2. *Two Hands Interacting*

*Marry.* No motion; 2 indexes held side by side. Tomkins makes this a specifying qualifier of *trade* (presumably on account of wife purchase), viz. the second member of a compound.

*Opposite.* No motion; 2 indexes pointing at each other.

*Unite, together, with, beside, by.* No motion; R index along L palm.

*Equal, same.* Indexes parallel, near, moved forward equally (Tomkins: "meaning, even race").

*After, future, behind, by-and-by.* R index moves about a finger-length beyond L.

*Before, past.* Starts the same; motion reverse, R index drawn back.

*Time.* Tomkins speaks of "diversity of gesture..., but we present the most logical. For abstract TIME..." His drawing shows only the starting position of AFTER and BEFORE, as if without motion; but his description says: "pull right hand about three inches backward;" which makes it identical with BEFORE. I doubt whether in pre-white days there was a sign for ab-

stract time; most native languages had no abstract noun for it, though they did of course have various temporal adverbs.

*Die.* R index moves forward under edge of vertical L palm.

*Rash.* L hand covers eyes, R index moves out. The two hands probably move more or less *simultaneously*, which would make a different type of compound from successive movements.

### 2.2. *The circle element*

There are at least nine compound signs that include the element of a horizontal circle (or rhombus) made by two thumbs and two indexes. The full compound gestures illustrate the principle of the same "radical" elements occurring in different context (and meaning); also the different place in the sequence of elements the same radical can take; and the general plasticity of compound formation. Most of the nine gestures denote definite and concrete objects, but one or two are abstractions (hole, center), and one or probably two are verbs when spoken.

The circle unit takes two forms: a complete circle with finger ends touching (4 cases), and an incomplete circle with the tips about an inch apart (5 cases). It is not clear whether the difference is intentional and significant or an accidental by-product of different manipulative sequences.

The following is an analytic comparison of the nine signs.

#### 2.2.1. *Circle the only element, but two steps to complete it*

*Surround.* 1, circle widely incomplete, several inches of gap between hands. 2, bring index and thumbs together.

#### 2.2.2. *Circle the first element of two or more*

*Center.* 1, form complete circle. 2, leaving L fingers in position, move R hand away and above, point down with index to center of where circle was.

*Hole.* 1, form incomplete circle. 2, leaving L fingers, move R away and above, point down with compressed fingers into center of (former) circle. — This sign is identical with preceding, except that the pointing is with 4 fingers instead of index — a hole is less localized, less pin-pointed, than the center of something.

*Island.* 1, form incomplete circle. 2, holding this with L, with right make sign for *water* (cupped hand before mouth). 3, with compressed R fingers execute conterclockwise circling outside original circle.

*Kettle.* 1, form incomplete circle. 2, holding this with L, bring R finger tips over to L index point, then carry in an overhead arc to L thumb point, the

motion indicating the handle or bail of the kettle. 3, insert R 4 fingers under this arc as if lifting it. This last seems a reinforcing determinative, making sure that unit 2 is understood.

### 2.2.3. *Another radical first, circle second, explicative third*

*Camp.* 1, sign for *tepee*, 2 indices at 45°, touch. 2, form incomplete circle. 3, lower both hands and circle. The last element is not explained, and no sign is given by Tomkins for *set* or *put*. The total caption is merely "camp". I conjecture that he means the Plains camp circle, and that the sequence of elements is: *tepee, in-circle, set.*

*Flower.* 1, sign for *grass* (hands hang full length, palms up, swung apart, but made at waist height). 2, make complete circle. 3, swing hands so wrists approach, thumb points maintain contact, indexes spread and rise, little finger knuckles touch. — The meaning is not clear, except that initial *grass* introduces vegetation, the circle may suggest a bud, the final element the rise and spread of petals.

*Lake.* 1, sign for *water*, cupped hand. 2, make incomplete circle. 3, holding thumb points in contact, pivot hands apart till indexes are spread away from each other, but wrists together. This last seems an awkward manipulation to make and its meaning is not clear.

*Spring of water.* 1, sign for *water*. 2, complete circle. 3, holding circle with L, bring R hand below, with fingers folded down. 4, snap R fingers upward twice (*bubbling*). Element 3 serves to put the R hand in position to achieve 4 effectively.

The last four signs nicely illustrate the typical method of building up compound signs. The first element tells what the sign will be about, the general area in which it lies: houses, vegetation, or water. Then comes the rhombus-circle to indicate that something round or enclosed is involved. Third is the specific determinative or explicative which gives to the compound its particular meaning.

In the four signs in which the rhombus-circle element comes first, the context orientation given thereby seems to be that of a round periphery or enclosure, within which something more specific is to be defined by a second or two more elements: the middle point, the hollow, the surrounding water, the handle to lift by.

In *surround* there is really only one sign but that dynamic, expressed by an initial and a completed stage. It is this completed stage that is used statically in the eight other occurrences of the rhombus-circle. *Surround* is the only sign that denotes an action. Several other such action signs — verbs in speech — are like *surround* in that the hand positions remain alike from beginning to end, though the meaning is achieved by motion of the hand or

hands: *sit, race, push-try-begin, come, go-depart, give, talk-explain, bet, whip.* But *surround* alone results in a shape being achieved by the motion, which makes it useful as a static element in compounds. *Sit* achieves a position, which might also be useful in compounds (cf. the possible *set* in *camp*); but I am not clear how widely it is so used. *Race* can achieve relative position, and is in fact the basis of a series of metaphorical signs: on the one hand *equal-alike*, on the other, *behind-after-future-soon* and *ahead-before-past-long ago* and allegedly a nonpositional abstract *time.*

## 3. ORDER WITHIN COMPOUND SIGNS

### 3.1. *Possible influence of speech*

In signs compounded of two or more signs, that one which denotes a concrete object usually comes first, specifiers and qualifiers follow.

In practice, this means that the element which in speech translates into a noun mostly is first, and that verbs, participles, adjectives, and adverbs follow.

Noun plus qualifier: *alike:* face same; *ambitious:* person push(ing); *angry:* brain twisted; *annoyed:* heart flutter; *autumn:* tree leaf fall; *bachelor:* man marry not; *bald:* hair wiped-out; *brave:* heart strong; *bury:* blanket wrap dig; *cannon:* gun large; *cavalry:* white soldier riding; *cigarette:* tabacco rolled small; *city:* house many; *coal:* stone burn good; *coyote:* wolf small; *crazy:* brain whirl; *dam:* river hold; *dangerous, sulky:* heart bad; *disgust:* heart tired; *divorce:* woman throw away; *drown:* water river (or lake) die; *fog:* water see-poorly; *give name to:* name give; *good:* heart level; *grandfather:* father hard-of-hearing (= old, otherwise signed by staff); and so on.

It wil be seen that the compound sign as a whole, when translated into speech, may be any part of speech: noun, verb, adjective.

The initial "noun" sign may be qualified by the "verb" sign that follows, as in heart flutter > annoy(ed), hair wiped-out > bald, robe black > priest; or it may specify the place, manner, or instrument of the "verb" element that follows, as in [with, in, by means of] *blanket wrap dig > bury, water river die > drown*; or it may be the object of the "verb" element, as in *river hold > dam, woman throw-away > divorce, name give > give name to, blanket food distribute > annuity gifts.*

There are cases of the "noun" object element following the verbal component, as in *steal women > elope, give lie > deceive, white chief give food >* (governmental) *agent;* but these require checking with native informants, just because their order is that of English speech.

Formally of course the sign-language as such has no way of marking

"classes of words" or "parts of speech" as such. My "verb" element or "noun" component merely denotes the element which in translation into spoken communication would be rendered by a verb or noun.

When it is a matter of two noun-like elements, the qualifying or determining one comes first, as in English: *tree leaves, whiteman chief, father*('s) *sister*, but *brother own wife* > *sister-in-law, white-man soldier house* > *fort.* There are seeming exceptions, as for *milky way* = *die road sweep-of-sky*, in which "die" may be *ghosts* or the *dead*; and *steamboat* = *boat fire*, but "fire" is the same as "burn", so that if we render *boat burn*(*ing*), we have the usual order of "noun"-"verb".[1]

In spite of there being no formal distinction of noun and verb in sign language, there is a degree of justification for considering to which class a meaning would be attributed in spoken speech, because presumably the sign language is secondary to speech, is a special surrogate for it, and may therefore have been influenced by it in such matter as order of elements in compounds.

Siouan, Kiowa, Athabascan, and Muskogian compound nouns by having the qualifying or determining noun precede, the verb or adjective follow the noun element; which is also the apparent sign language order. In Algonkin, Uto-Aztecan, Kootenay compound nouns, the qualifier precedes, irrespective of whether it is noun, verb, or adjective, as in most indo-European languages (Romance and Keltic are exceptions).[2]

About half of the nineteenth-century Plains-culture Indian spoke Siouan languages, about one quarter Algonkin, then followed Caddoan, Uto-Aztecan, Kiowa, Athabascan. The suggestion is that the Siouan compositional order of elements was adopted for sign language compounds.

Two special classes of components take final position in compounds. One is the negative: *long* (time) *rain not* = *drouth; sit not* = *absent; man marry not* = *bachelor; look much sleep not* = *vigilant*; *stone not* = *soft.* This is also the position of the negative in sentences.

The other class is less certain, and is uncorroborated by utterance position.

[1] Tomkins gives *Tree Indian* for Chippewa, *Bird Indian* for Crow. It is conceivable that there might exist a special rule of element order in tribal designations. But the majority of his listings indicate first that people or Indians are being dealt with, and then add the specifier for the tribe; so that his renderings for Chippewa and Crow are presumably simple errors of translation by the English word order.

Compare: *Arapaho* = *Indian mother; Cheyenne* = *Indian finger-cut; Comanche* = *Indian snake; Navaho* = *Indian work blanket striped; Pawnee* = *Indian wolf; Sioux* = *Indian cut-throat.*

Tomkins has occasional other slips of adjectival order. Apparently where it is a matter of a proper name in English like tanding Rock Agency (p. 49), that order is used. But I query the Little Beaver, Two Owls, Big Bear of p. 63. These might be members of an Algonkian tribe, but more likely they are only renderings of imaginary Indians directly from English into signs.

[2] I had a paper on this as long ago as 1910 in *Anthropos* 5:204-218.

It consists of prepositional elements, which in many American languages are expressed by suffixes. I find the following instances: *work with = help, aid*; *go fight with = allied, allies, "alliance", level river across = bridge* (I translate as "level"; the description is a static "prairie"). This class needs verification. *Across* is also *to cross; with* is also translated as *joined, unite, and.*

### 3.2. *Degree of order possibly intrinsic to gesture communication*

It is probable that clarity is most easily achieved through signs by beginning with readily identifiable gestures and then adding specifying ones as context is built up. On the whole, concrete objects or concrete acts are most easily represented intelligibly by hand motions. If the utterance has a subject, it is an advantage to have that fact established early. To use Herbert Spencer's example, but in reverse effect (he was dealing with speech), it helps to know first, in the slow and incomplete development with which gestures proceed, that it is a *horse* that is being communicated about, and then that it is *black*; some indubitable context or area of relevance is set up by the first sign. If the beginning were made with *black*, any one of innumerable black objects might follow next; or indeed it might turn out that the information was not about an object at all, but about darkness or night. In speech, whose execution is far more rapid, the memory span easily retains several associated units and their order is accordingly less important, as long as the one accepted convention is consistently adhered to.

It remains to be discovered, accordingly, whether it is general considerations of this nature which have chiefly established sign order, or the influence of translation from speech. Both may have been at work.

### 3.3. *Order of signs within utterance*

I do not go fully into the matter of syntactical order in sentences because too many passages fall under suspicion of having been corrupted to the English sequence, and it will be safer to record new texts in which such error is guarded against than to try to base definite conclusions on published material which may be imperfect and is at times contradictory.

The probable orders seem to be: subject-predicate; predicate-object; determining noun precedes determined; qualifying adjective probably follows its noun; numerals and restrictive adjectives perhaps precede; "grammatical" elements (plural, possession, negative, etc.) follow the sign to which they relate, but "possessive pronoun" compounds precede their "noun": *you-own house.*

## 4. SOME EMPIRICAL CLASSES OF SIGNS

It seemed profitable to bring together as much empirical material as possible on certain limited classes of signs which are somewhat special either semantically or functionally.

### 4.1. *Signs for subjective states or acts*

*Afraid, fear*: *shrink from*: 2 indexes forward, curve down as hands pulled back; *ambitious: person, push; fond of, love: hug; jealous: elbowing aside:* fists to body, alternate elbows jerked back and out; *pity me:* 2 parallel indexes, backs forward, drawn to breast; *ashamed:* motion of pulling blanket over face; *astonished:* L hand over mouth ± R palm warding off; *angry: brain, twisted*; *crazy, fool: brain, whirling; annoy: heart, flutter; glad, joyful: heart, day* ( = open up), *sunrise; know, think: heart, "drawn from"*? — R hand to R, index turning down; *melancholy: heart, sick; remember, memory: "heart, know"* — since *know* contains *heart, remember* is probably the same sign as *know; undecided, perhaps: hearts, two:* 2 fingers to heart, then hand rotated from forearm; *wise: heart, brain, good; forget:* "mental darkness" — said to be same as sign for *night*, except L hand is kept motionless.

### 4.2. *Tool signs*

A small class of signs executes motion made with an imaginary tool, usually with two hands. Such are: *arrow* (as drawn from quiver), *bow, bag* (filling), *awl, sew* (with awl), *carry* (load over one shoulder), *pipe* and *smoking, maize* (shown by shelling movement). One-handed are *whip* and *old* (setting a staff forward).

### 4.3. *Centrifugal motion reserved for "passive"*

There is a sort of active-passive distinction in the signs for a few verbs, which is really a centrifugal-contripetal inversion.

*Charge others:* both fists near R shoulder, moved sharply down and L, fingers snapped open.

*Charge against us* (viz. being charged): "reverse by holding fists [backs outward] well out in front and snapping hands open toward face".

*Give:* flat R hand, palm up, at R; moved outward and down.

*Give me:* R hand open, well in front, at neck level; brought toward body and lowered slightly. So the text. The figure shows the hand at elbow height, brought upward to R shoulder, palm under (perhaps with a downward flip at the very end). Authentication is needed; but the centrifugal-centripetal contrast is sure.

*Pity and pity me!* See the Signs of Doubtful Reference for this reversal.

### 4.4. *"Grammatical" signs*

What might be called the grammatical armory of the sign language is a meager array. It consists of signs for denotations which in most languages are expressed by affixes, inflections, ablaut, or other grammatical machinery, but in English, and still more markedly in Chinese, are expressed chiefly by independent and mostly unmodifiable elements, as in the sign language. This is the apparatus:

For person: *I* = *me, you,* both by pointing. There is no sign for a pronoun of third person who is not present. Tomkins says: "He or him: point right index at person indicated." That of course makes the sign grammatically a demonstrative, like the expression for the first and second person. (It may be noted that some American native languages have no true personal pronoun of third person, other than by default; and some have no affix for third person in the verb.)

For number: *all* is postposed to nouns and pronouns.

Possession is indicated by a simple gesture whose "origin" or pantomimic reference is not clear. It is added to noun or pronoun; independently it is translatable as *have, own, possess,* perhaps *belong.*

"Tense" can be indicated when necessary by independent signs for time relations: *now, soon (later, by and by), long ago, "past", "future".*

In a few cases a sort of passive or receptive is indicated by reversing a sign from its usual centrifugal direction to centripetal, as cited in the preceding section.

There is a sign (pantomimic significance not sure) for *no, not, lacking the quality,* postposed to what is negated.

There seems to be no conventional way of expressing an imperative. The sign for *push (try, begin)* is also listed under *must* by Tomkins, "used as a command". His sentences no. 54, 104, 123-126 contain English imperatives in the translation, but the action signs have nothing added to their declarative (basic) forms.

*Perhaps* can be used for contingencies and its sign would therefore be translated also as *if.*

The one "grammatical" sign that must come first — for obvious reasons — is the *question indicator* — slightly twisting the upraised open hand. It is quite generic, and context decides whether it is best translated as *who, what, which, when, where,* or *why.* Tomkins cites some special cases, such as *question, how many, moon,* for "when", in which *how many* is really *count* (striking down fingers). For "where" he says that several directions can be pointed at after the *question* sign. For "why" he cites only the *question* sign but adds: "turn the hand very slowly". This type of modification of a sign is unusual, except where the function of the modification is transparent (as in speeding a motion

up or continuing it longer); which does not hold in this case. I suspect that slowing the *question* sign means something else, such as perhaps: *are you sure?* or asking for *corroboration.*

All the grammatical signs are one-handed and simple — somewhat as grammatical morphemes in spoken languages are usually monosyllabic or shorter. They do however combine, as in *I all* = *we, you own* = *your.*

## 5. SIGNS OF DOUBTFUL PANTOMIMIC REFERENCE

As one studies the sign languages, one becomes aware it is overwhelmingly pantomimic. Many signs are quite transparent, especially if one knows the culture. One begins to follow partly even on first contact, though no complete stranger would grasp much continuity. Other signs appeal as "reasonable" once one has learned their meaning by context, association, or explanation. This semantic near-intelligibility must have made the system rather readily learnable.

Many signs, single or multiple in elements, might however be construed reasonably enough in several different ways, of which the conventionally correct one must be known if intelligibility is to be smooth. One cannot hold three or four alternatives open in memory while the context is slowly eliminating all but one — yet at the same time new open alternatives also get introduced by the growing context. When one has learned the correct meaning of a gesture for which several meanings might suggest themselves, the correct meaning will generally be seen to be at least or about as "reasonable" on the average, as inferable from the positions and motions executed, as the others. Yet the important requisite as regards effective functioning of the system of course is that each gesture (1) be unequivocally distinctive perceptually and (2) have one and only one meaning or range of meaning, even if this seem more "arbitrary", less obviously pantomimic, than some other meaning. In the end it is this that makes the system a "language".

Nevertheless there is a striking difference between spoken language and sign language in that speech consists overwhelmingly of elements wholly without transparent or inherent resemblance of symbol to signification, but the sign language elements overwhelmingly do show such connection or resemblance between gesture and meaning. That is, the signs mostly in some degree mimic or pantomime[3] the thing, motion, or quality denoted.

This fact shifts interest to the minority of signs which do *not* mimic intelligibly at first sight but embody some convention, and therefore raise a problem as to what this is, or its history.

[3] Pantomime is not a strictly accurate term because it refers to imitation performed with the whole body, whereas the Plains sign language is executed essentially by the hands and would rather be *cheiromimic.*

I assemble here a series of such "dense" signs, all of them with fairly important denotations. For some of them I shall suggest tentative explanations. But I press none. Informants who have been taught[4] practice of the sign language may have been given explanations; and, whether such explanations are objectively founded or not, they deserve to be heard before conjectures by non-practitioners. Also, it is I that may be dense in not seeing a resemblance. On the other hand, there may be other signs that I do not list here because I fancy I see a plausible explanation, which however may be false.

My list extends to about 20 signs out of perhaps 400 pictured by Tomkins (after allowance for deduction of repetitions under different English words). Five per cent of non-mimicking signs is not far from the proportion which mimicking or onomatopoetic words may constitute in some spoken languages.

Of course it is possible that inquiry with informants may quickly reduce the list. On the other hand, inquiry may also lead to quite different explanations; in which case we might construe many of them as counterparts of "folk etymologies", that is, secondary rationalizations. The list of sign language terms without authenticated "etymologies" might even grow with increase of systematized knowledge. If it shrinks, the residual core of unexplained signs will be correspondingly more intriguing.

I may also have had some quick but spurious insights. Thus the all-important *perhaps* and *question-follows* signal, with the hand held up and twisted two or three times: it seems to me to express doubt or ambivalence, and perhaps some stand-offishness, or mild negativism also. At any rate, I have not included it in the unexplained list; but possibly it should be there.

*Father: mother man* (?).

*Mother:* Tomkins suggests *suckling*, but there is also a mother sign indicating *pregnancy*.

*Brother, partner:* 2 finger tips to lips, pulled away, followed by *men*.

*Sister:* same, but *woman* precedes (sic.) The parallel fingers probably indicate growth together, but why the lip touch and drawing away?

*Brother-in-law:* crossed arms, hands in vertical plane, R strikes down — why?

*Friend:* raise 2 joined erect fingers: "growing up together". "Friend" may be Indian English for kinsman.

*People:* "R index, shoulder high, moving up and down." Drawing shows both indexes up, moved back or outwards. — Perhaps "plural" of *man* = R index raised in front of face?

[4] Are practitioners taught the system, or is it possible for them to pick up most of it by watching sufficient context? A series of informants' responses on this point would be worth having.

*No, not:* flat R hand before body, rolled R and palm up, returned. Is this a hand-shrugging I-don't-know negative, a sort of polite discarding?

*All:* flat hand circled horizontally to left (counterclockwise). Circle for "all-around", "far-as-can-reach"?

*Possessive, own, have:* fist before neck, thumb inward; tilt fist forward from wrist so thumb points forward.

*Another:* R hand on L breast, swept back to R in wide arc, ending palm up. Meaning possibly, "Another one disposed of and behind me" (?)

*By itself, isolated, free:* R hand at R breast, fingers forward, palm half up; jerk hand 2 or 3 times by flip from wrist toward body. "Metaphoric idiom used with other gestures." Wholly unclear.

*Forever:* R palm to near R side head, moved forward and back.

*Fix* (= mend?): L hand on edge, R on edge across top of left; R pushed forward like saw, while left rolls level with back up.

*Work:* hands parallel, on edge, near, R higher and behind; raise and lower both in their planes, from wrist (alternately? jointly??), "to indicate working" — but what kind of work?

*Mistake: work, hide.* The signs are clear, the logic obscure.

*Know, think:* R and over heart, index and thumb spread; move horizontally outward, palm and index down. Tomkins has confused *know* and *know not*; under *think* he says "drawn from the heart", but he gives no sign for *draw*, nor any other sign that seems to contain this motion.

*Thanks:* 2 flat hands side by side, backs up, swept forward and down toward donor. I have seen this gesture made ritually by the Arapaho in 1900: it seems to be a sort of grateful stroking down the body.

*Pity:* 2 indexes up, backs inward, carried forward and down toward person pitied. The request *pity me* turns the index backs outward and draws them toward own body.

*Spotted, mottled, off-color* (S. tribes): 2 hands back to back, fingers rubbed back and forth several times.

*Holy, mysterious, medicine, supernatural:* 2 fingers held up before forehead, palm side forward, spiralled upward and to R. Tomkins: "something mysterious and unknown". Query: not knowable by senses and reason, hence the whirl up (?).

This list contains five terms for kin, two for other people; half-a-dozen "grammaticals"; three verbs having to do with working, three referring to thought or feeling; and a couple of others. Most of the significations involve interrelations; which is perhaps not surprising, since concrete objects and acts presumably lend themselves more readily to denotation by positions and motions than do relations.

## 6. CONCLUSIONS AND GENERALITIES

The sign language, like writing, is a substitute for speech, not an independent or original method of communication. It is used when addressees are present, but do not understand one's own language; whereas writing reaches distant or future addressees.

The concepts which sign language communicates are basically concepts already developed in speech but translated into a non-spoken medium. This medium is strictly manual: manipulations of hand, hands, and fingers, including where necessary the touching or pointing at other body parts, directions, or colors.

While at present the sign language is reported to be generally accompanied by a running translation into words, as it is also when performed as an exhibition for English-speaking white audiences, this seems to be a recent feature. The older accounts seem not to mention it, and such inter-tribal use of sign language as I witnessed around 1900 was completely silent. The recent "double" method argues a ceremonious or display usage before a public not well acquainted with the sign language and perhaps partly still learning it as they both see and hear.

While the basis of sign language is concepts that have grown up as expressed in speech, it is unlikely in principle that all such speech concepts should be expressible by manual gestures with equal ease, precision, and effectiveness. Such complete translatability is not achieved when speech is converted into writing, and it would not be expectable when it is converted into hand symbols. Moreover, the sign language with its large "pantomimic" or directly representational component is more of the general nature of early pictographic and ideographic writing than phonetic. In fact, it is not even of the stage of category of "mixed phonetic-ideographic" writing like Chinese or Hieroglyphic, since it seems to contain, as a system, no aids or accessories that are phonetic. (Some slight contrary possibilities are touched on in the final section on Problems.) This is the reason the sign language contains no units corresponding to phonemes: it possesses no phonetic constituent nor even any attempt to translate phonetic elements into manual symbols. Herein it differs from all true writing systems, even early Sumerian, Egyptian, Chinese, and probably Maya, which very soon added some phonetic endeavors, no matter how coarse, to the mere visual delineation of things and acts. So far as this limitation of stage of execution is concerned, the sign language has remained at the level of unimproved, ungrafted-upon pictography, which indeed writers on sign-language have been fond of comparing it with.

On the other hand, *specific* resemblances between sign language and pre-Caucasian American pictography are really very few. The similarities are generic and only two: both methods appeal to sight, and only to sight. The

*positive conventions* which are so strong in the sign language are lacking in pictography. I know no picture writing in which an erect index finger means *man*, or the hooked fingers swept down the side of the head mean *woman*, or other signs of similar conventionalization.

Another obvious difference is that the sign language is actually communicative in intent, whereas native art was primarily decorative. It might also serve ceremonial purpose, in which case it worked out certain symbols. But the meaning or purpose of these was known beforehand — somewhat like the words of petitioning prayers or compelling formulas, or the motions of a dance — so that it was their *enactment* that counted, as contrasted with communication. It is quite likely that most communication, except where actual words were used in ritual, is read into ancient pictography by us rather than having been present in intent. If communicative purpose had been present, we ought to be able to understand a large proportion of preserved pictographs instead of being so largely baffled by them.

Another point of difference is that a pictography able to communicate a wide range of information presupposes an ability of realistic representation and discrimination that in general was far beyond native capacities. Such ability generally has to be taught or learned and rests on a developed tradition. On the other hand, the manual and digital skill required to make sign language gestures is in no way special. What there is traditional in it is its conventions: associations of particular gestures with particular meanings. Adequate execution of the gestures would never require more than several trials and might succeed at the first attempt.

Of course, it is also possible for pictography to get along with a moderate degree of skill in lifelike representation, in proportion as it succeeds in developing accepted conventions. This is the path followed by the picture-writing of southern Mexico, which grew up in a society calendrically interested and therefore future-oriented — also elaborately ritualized as well as technologically diversified and expert.

As for the non-rock-carved pictography of the Indians of the United States and Canada which communicates information on events, the first question is how much if any such visible communication there was before Caucasian stimulation. Personally, I feel quite dubious whether there was any. All the recorded pictographic messages and letters may be products of stimulus diffusion from observation of alphabetic writing.

True, it is also possible that the sign language is post-Caucasian. But, whether early or late, the sign language had two advantages over picture writing, which presumably caused it to become standardized, effective, and widespread. First, it resembled speech in that while evanescent its medium was bodily, and second that it was directed at specific, living, present auditors, who might make reply; whereas nonevanescent picture writing involved

extrasomatic media and materials and was directed to remote, potential, unknown, or future audiences or recipients. In both respects the sign language remained close to the conditions and orientation familiar from spoken language, whereas pictography was a move in the direction of conditions and purposes familiar in literacy, but a highly imperfect move in that direction.

It cannot be emphasized too strongly that the sign language contains a large ingredient of convention, in fact that specific convention is of its essence. It embodies some "natural" gestures such as might be made spontaneously and understood without learning. But it is in no sense a "universal" sign language as Tomkins calls it, and as Mallery's comparisons with deaf-mutes' and Neapolitans' signs suggest he wanted to believe. The cupped hand before the mouth might be understood in any culture as denoting drinking; and it is of course potentially extensible to water; but that it was extended to denote water in such meanings as *lake* and *island* and *drown* is a specific convention of the Plains sign language. Ripples might have been chosen instead to denote water, as in Mexican, Egyptian, and allegedly in Chinese writing. All we can as yet say about the general direction of Plains convention is that it perhaps favored conventions which had reference to human bodily activity in connection with the referend, rather than an intrinsic act or property of the referend — *drinking*, in short, rather than *rippling* or *splashing* or *flowing*. Drinking might be easier to represent by manual motions, rippling by linear execution with stylus or brush; but be that as it may as to the reason for the difference in convention, in this and other cases, convention becomes an essential ingredient in any communications system.

(The term convention is of course not to be understood in any literally conscious sense, as if people had "convened" in order to come to an agreement on a problem, but as an unplanned process by which tradition becomes established and effective.)

Another instance of a convention-bound sign is the negation, important not only in sign language "sentence utterances" but in sign formation. According to Tomkins, it is a throwing to the side of the droop-extended right hand while it turns upward. I think most of us reared in Western civilization would, in a situation of naive nonacquaintance, tend to construe this as a gesture of indifference, doubt, or so-be-it acceptance — a sort of shrug — rather than as the flat negative. It seems, however, to be the usual *not* and *no* gesture.[5] In our Western culture we would certainly understand a sidewise head shake as negative. A sidewise shaking of the raised flat hand is actually used widely in Latin America, and tends to be understood in the United States.[6] A shake

[5] Mallery also gives this for Dakota (four informants), Mandan-Hidatsa, Kiowa Comanche, Wichita, Sahaptin (pp. 440,441).

[6] Mallery, p. 440, cites this as a negative from Dunbar, Long, and Creel. He adds a *single* motion of R hand to R before the face as being cited by Wild, and as given to himself by Cheynne, Arapaho, Crow, Hidatsa, and Arikara informants.

of a raised finger to right and left might or might not be understood.[7] A raised palm would I think be spontaneously understood rather widely as "do not come forward", "do not pursue the matter". Yet the most nearly standard or commonest negative sign in the Plains is the throwing-open or pushing-away back hand gesture.

And it is interesting that something very close to the raised flat-hand back-and-forth sidewise motion which is actually reported as having a secondary, local occurrence as *no* in the Plains — namely, a slight back-and-forth *rotation* of the raised palm — is the regular *question* sign throughout the Plains. In short, there is a natural and spontaneous basis for signs, but they are defined by convention.

When we correctly grasp a pantomimic sign-language gesture, we have a sense of achievement, are pleased, and remember the meaning. When a gesture is puzzling, or we can conjecture several meanings for it, we feel baffled. The result is that we tend to overestimate the pantomimic transparency of the system, or at least to assume that such a transparency lies just below the surface, which is certainly not necessarily always the case. It seems reasonable to believe that the great majority of signs are representative or mimicking *in origin*, possibly all of them. But what is characteristic of the sign language as an effective system of communication is precisely that it did *not* remain on a level of naturalness, spontaneity, and full transparency, but made artificial commitments, arbitrary choices between potential expressions and meanings.

It remains to be ascertained by directed inquiry how far sign speakers use their signs by rote memory, or on the contrary understand their origin and can explain seeming arbitrarinesses. Even in the later case, it will be necessary for the student to try to judge how far the explanations are ex post facto rationalizations, or mnemonic devices, and not actual historic developments.

We shall have to keep in mind in this connection the "etymology" of Chinese characters (the great majority of which are combinations of sound constituents with meaning classifiers or "radicals", many of them being already previously combined). The Chinese seem to have traditional explanations of all characters that are not patent mere pictures, and many of these are likely to be historically correct, whereas multitudes of others are fantastic and highly improbable explanations, though perhaps not without value as mnemonic aids in learning and remembering characters. One of the chief inquiries in future sign language study should be directed at this point, of whether such explanations of non-transparent meanings as executants can give are historically realistic or fanciful.[8]

[7] Mallery actually cites this, p. 442, fig. 270, but only for the marginal Paiute and Apache.

[8] Thus the Chinese character for two, "I," contains radical no. 62 of the 214 (pronounced *ko* when alone), which relates to weapons and shows 2 crossed spears, and which contains

However, we need not fear a situation as difficult as in Chinese, for several reasons. First, Chinese writing runs up to about 8,000 characters, even after definitely rare and technical characters are omitted. We do not really know whether any sign speaker controlled even 800 different simple and compound signs. Second, the Chinese complexities are due to the combination of ideograms with glottograms — meaning-classifier signs and sound signs — and the latter coming in a bewildering array of homonyms. But the sign language has no second array of phonetic elements nor apparently a second array of elements of any non-manual order. If there are complicating principles still to be discovered in the sign language, they are only of subclasses of manual signs. It is because of this possibility that I have in the body of this paper stressed the intensive analytic classification of sign elements.

How far the sign language may be extensible is unknown. Signs have been recorded for *automobile* and *motion picture*, but these are part of the daily life of modern Indians. No doubt signs could be devised for carburetor, valves, piston rings, and accelerator; but in most cases it would be simpler to use the English terms even as between a Cheyenne and a Crow, just as if a Cheyenne and a Crow wanted to discuss Whitehead's philosophy they would probably know of him through English and continue with that medium. After all, the sign language was devised to communicate fairly elementary things in essentially simple situations. It undoubtedly is capable of expansion; but it seems likely that any notable expansion into abstract or subjective discriminations and nuances would be possible only, as in the case of written speech, by the addition of symbols for the *sounds* of speech.

## 7. INDICATED PROBLEMS AND PROCEDURE

In the sixty or more years that the sign language has been neglected, the analysis of culture and especially of spoken language has advanced enormously. It is probable that systematic analysis would result in new conceptions, and certainly more definite ones, regarding the sign language.

What is needed first is the complete lexicon, with regional and dialectic variations in their place.

Equally important is a sufficient corpus of text, preferably of speeches actually made, actual conversations, narratives of actual events.

While the grammar of sign language seems exceedingly rudimentary, the

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also a phonetic element that gives the sound *wo* of the spoken word. The reference to "I" is explained through the radical, thus: the two crossed spears are opposing rights, by extension my rights, and therefore *me*. (Wilder and Ingraham, *Analysis* 1922, no. 2; Wilyer, *Characters*, no. 71Q).

grammatically functioning elements or surrogates should be inquired into exhaustively and with precision. Order is certainly important, and probably fairly prescribed in the interest of intelligibility, though the rules may be more complex than so far indicated. There may have been some invasion of these rules by English influence, or even variability according to native mother tongue. Grossly, the position of qualifying noun, adjective, or verb to the grammatically governing but semantically qualified noun seems most in need of verification.

I am confident that the basic record can and should be in verbal description. With skill, descriptions can be brief and vivid — briefer than they mostly have been. The first requisite of course is to distinguish the characteristic pattern of motion or position from accidentals. Intelligent informants will grasp the point here. There is no harm in a few obvious abbreviations, like R and L, but in general abbreviations and symbols should be left to force their way into usage, not be sought in advance.

The verbal description should be supplemented by outline linear sketch — as a check, and also to correct ambiguities or awkwardnesses of description. (In the same way, a good description will show ambiguities and errors in sketches). Outline drawings like those of Tomkins are mostly adequate; Mallery's are better drawn but would be costly today. Photographs introduce new complications, especially of accidentals. The important requisite is a *decision* as to what position or motion is the one essentially aimed at or intended, plus some recognition of the range of allowable variability, speeding up, curtailing, etc. — exactly as in the determination of phonemes. Photographs may happen just to catch this salient characteristic, but the inquirer must *know what it is.* If he does not know, he may snap his shutter a tenth of a second to soon or a fifteenth late. The ideal perhaps would be a motion film taken *after* the signs used were known, not before. Yet going over a strip of film to select out the most characteristic position or moment is inevitably time-consuming and tedious.

Films shown in motion reproduce total experience including tempo, elegance, etc. They stimulate interest, and are excellent as an introduction or in review. They are of course only fleeting raw material for scientific understanding and record.

I suspect that half or a majority of the substantive data on the sign language may prove to be already on record. What is needed is *systematic analysis of the sign language in terms of itself,* which is equivalent to a full and meaningful description of its properties.

What the particular terms may be through which descriptive and functional understanding can be obtained, is something I have tried to suggest by the several special analyses and classifications proposed in the body of the present paper. Obviously, these are no more than samples and indications, and quite

other considerations may have to be taken up before all aspects of the language are covered.

I trust it will be understood that I do not consider the sign language itself to distinguish nouns, verbs, adjectives, etc. It translates what are noun and verb morphemes in spoken languages. It suppresses most grammatical and relational morphemes — much as a telegraphic style of writing suppresses some. Such affixes or relational elements as it cannot, on account of intelligibility, merely omit, it accepts as units of the same order as stem morphemes. The reason it has no equivalent to phonemes is that it begins to operate only on the level of morphemes, and so far as possible semantically substantive morphemes — many relational ones would be hard to devise gestures for.

An analysis of sign language in terms of itself would involve a classification of its semantic concepts and one of its executional forms.

The classification of meanings would include consideration of which classes were richly or meagerly developed; how far subjective denotations, abstractions, qualitative properties might be scanted because of difficulty of representational coding.

The analysis of forms executed would include a classified list of minimal elements; consideration of compounds of these to express units of meaning; the grouping of elementary and compounded signs into statements; the order both within signs and between them; the use of redundancy or determiners and over-determiners in the interest of ready clarity. There would further be consideration of homomorphs and near-homomorphs or contrastive pairs of these.

The question would also arise whether non-morphemic sounds of acts like sucking, blowing, smacking, belching, hiccupping, flatulating, neighing, bellowing, chirping were allowed to be directly imitated as supplements in sign language or were puristically ruled out in the interest of elegance of execution.

It will also be important to inqure of informants as to the reason of both simple as well as compound gestures — why they are executed as they are, whether merely conventional or explainable. If some of the answers are only rationalized folk etymologies, they will nevertheless help delineate the character of the system as a whole. I should expect a residuum of unexplained or dubiously explained signs, though a minority.

The possible influence of element order and word order in the native speech of diverse tribes would further have to be gone into.

And finally there would be the question of regional or tribal dialects of sign language: how important these were; whether they affected chiefly particular signs or extended to principles; and if they were associated with differences in the use and function of the sign system in the total life and culture.

While I am confident that the Plains sign language is a derivative of spoken

language — a special and partial translation of it for particular purposes — it is nevertheless a concordant system of extraordinary interest. It seems consistent, it was unplanned and grew up traditionally, it was effective as well as picturesque; and if it proves to have been limited in range and vocabulary, it makes up for these limitations by an unusual originality of execution. It is a definitely small system, but well characterized and apparently clearly bounded. Like every such limited universe, its serious and penetrating student can hope to achieve the ultimate reward of virtually exhausting knowledge and understanding of the system.[9]

[9] Carl and Florence Voegelin, West, William Shakespeare of Arapaho, Wyoming, and I met in Berkeley September 9–13, with fruitful clearance of ideas and sharper realization of problems. It was there I learned of the one 20th century contribution of theoretical importance on sign language, J.P. Harrington's five articles in *Indians at Work* in 1938 which I should have known before but have not yet seen at the time of proofreading on October 1, 1957.

# SIGN LANGUAGE ANALYSIS, ON ONE LEVEL OR TWO?

C. F. VOEGELIN

1. The Sign Language used by Australian aborigines would not be intelligible to users of the Sign Language which has its provenience in the Plains of North America; nor vice versa. The latter was not supplanted by English when that spoken language became a *lingua franca* among Plains Indians who represent, in their diverse languages, every one of the half dozen separate linguistic phyla set up by Sapir for North America (except Eskimo-Aleut). The development of dialect peculiarities in this Sign Language has continued after the European contact period, but all dialects known today are mutually intelligible. Masters of this Sign Language are no longer confronted by other unintelligible Sign Languages — if indeed, they ever were — though such exist; but beyond the contact range of users of Plains Sign Language. The Sign Language discussed in this Note is limited to one dialect of the Plains Sign Language and, further, to the idiolect or idiolects represented by William Shakespeare, an Arapaho Indian.

Though communication in the Sign Language is executed through bodily movements, these are restricted to the upper extremities (either to single or to paired hand-and-arm movements; when both hands-and-arms are used, one acts upon the other in successive sequence, or both are used simultaneously in identical-parallel or converging-intersecting movements). Despite this extreme restriction in bodily movement, the scope and size of the Sign Language lexical inventory is enormously greater than that of the relatively unrestricted bodily movement bee language discovered by Karl von Frisch. There would seem to be an inverse correlation between the greater number of possible bodily movements in the bee language and the fewer number of lexical items which have so far been revealed by experiments for eliciting in the bee language. In fact, John Lotz contends that this paucity in the lexical inventory makes communication by bodily movements of bees non-analogous to communication by spoken languages [and hence, likewise, non-analogous to human Sign Languages which, in addition, have to be learned — in teaching a Hopi child, our Arapaho informant held the child's hand and turned it to execute the sign for general question. And also, in addition, some non-neighboring Sign Languages would be unintelligible — as that of the

American Plains and that of Australia — while bees brought from Australia would understand the bodily movements of bees hived in the Northern Plains of America.]

For the Sign Language, the scope and size of the lexical inventory is certainly much closer to that of a spoken language than it is to that of the bee language — but, still, approaching rather than equaling the magnitude of a spoken language dictionary. For one thing, the lack of neighboring unintelligible Sign Languages means that large scale borrowing of foreign signs is precluded.

Now, aside from the magnitude of its referent range, the Sign Language dictionary is really not comparable to any known spoken language dictionary. It is possible, however, to imagine a spoken language which would give the comparability not actually found: a spoken language made up largely of onomatopoeic morphemes. Upon hearing this unknown imaginary language for the first time — with its barking, booming and thumping sounds — one might be tempted to decode right off: to say that dogs and horses were running away because it was thundering; or were running toward game while hunters were shooting. Since spoken languages, as we know them, include a negligible fraction of onomatopoeic morphemes, we have no clues to go by upon first hearing an unknown language, unless we analogize something about its contour spans to some association we have about the production of contour spans in our own language, and say the speaker of Navaho seems to be querying or the speaker of Arapaho seems to be querulous, or the like; but this kind of overall impression is not really a guess at decoding.

We can now predict what will happen when people watch LaMont West projecting movies of Northern Plains Indians in conversation, or executing long narratives (or when people watch our Arapaho informant executing short utterances in Sign Language): most casual observers cannot resist making a guess or two at decoding. But the same observers never attempt to decode spoken Arapaho when they hear it played back from a tape recorder.

The preponderant part of all the literature on the Sign Languages is concerned with its lexical resources, either on the false analogy of its dictionary and the dictionary of a spoken language or else — conversely — to show precisely the non-analogous nature of Sign Language. The genius of the Sign Language as a unique system has been approached, so far, without benefit of initial grammar, of a preliminary ordering of regularities. That the literature does, in fact, center on the compilation of the dictionary as I assert it does, is demonstrated — and justified — by A.L. Kroeber.

All publications to date, including Kroeber's and J.P. Harrington's (in several successive issues of INDIANS AT WORK, twenty years ago), have been concerned with the size and scope of this dictionary. Though not wanting to stop with a mere lexical compilation of the Sign Language, the independent

views of both Kroeber and Harrington seem to suggest that one cannot go very far beyond this — farther perhaps in making classifications and subclassifications of Sign Language lexical materials (as the class of pantomimic or gestalten or outline signs — by far the largest class; or as the class of pointing-to signs, or of wholly arbitrary signs) than in sorting out arrangements of combinatorial possibilities (as 'compounds' or 'noun phrases' in which the order might be either 'adjective — noun' or 'noun — adjective'). Kroeber takes the lexical unit or morpheme to be the minimum component in the analysis of Sign Language: "The reason it has no equivalent to phonemes is that it begins to operate only on the level of morphemes, and so far as possible semantically substantive morphemes — many relational ones would be hard to devise gestures for." There can be no question of the adequacy of Kroeber's minimum component, so far as lexical inquiry is concerned; or even as concerns a modest grammar — *a grammar which is, strictly speaking, an appendix of the dictionary.*

2. A spoken language is susceptible to phonemic as well as morphemic analysis. If the minimum component of the Sign Languages is on the morphemic level, then we have still another dimension in which Sign Language is non-analogous to a spoken language. We return to this question presently (4 and 5, below), but first state some of the contrasts which exist and the consequence which follows, in the analysis of a spoken language, from its susceptibility to dual level analysis. If the Sign Language should turn out to be susceptible to dual level analysis, then the same consequence should follow when it is analyzed (*the dictionary functioning as an appendix of the grammar*). If the Sign Language should turn out to be susceptible solely to morphemic analysis, the consequence would probably be that already noted under 1 (*the grammar functioning as an appendix of the dictionary*).

On the first of the two levels of analysis, we set up the phonemes which, for any particular spoken language, are (1) not only finite in number, hence constituting something like a closed corpus; (2) free of referent value or grammatical meaning; (3) combinable in certain sequences entirely in terms of their own level for each particular language, as the freedom of /ŋ/ before and after vowels or consonants (in Hopi), or as the restriction of /ŋ/ to syllabic final (in English); (4) combinable in certain sequences in regular interdependence with the second level morphemic units, as in Shawnee where words begin only in consonants and end only in vowels; (5) combinable in very many sequences in irregular interdependence with second level units, as where the phonemes appear in sequence as the basic — and arbitrary — constituents of morphemes. The first four of these features surely belong to the grammar; perhaps the fifth belongs to the dictionary: "The linguistic student should never make the mistake of identifying a language