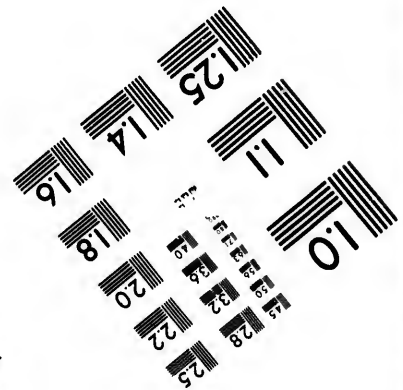
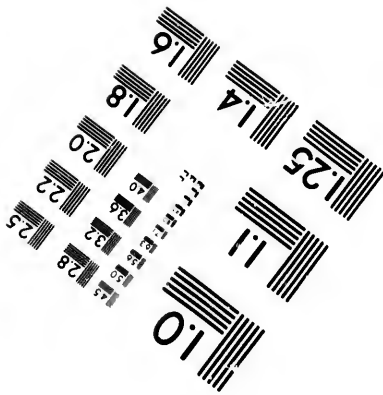
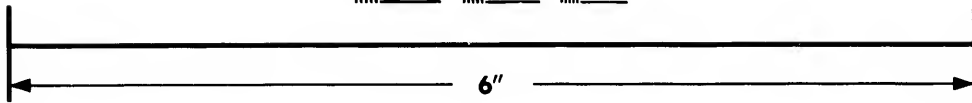
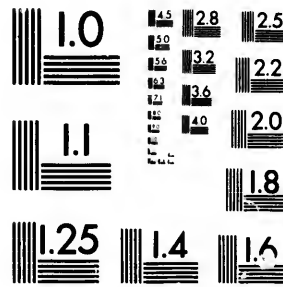


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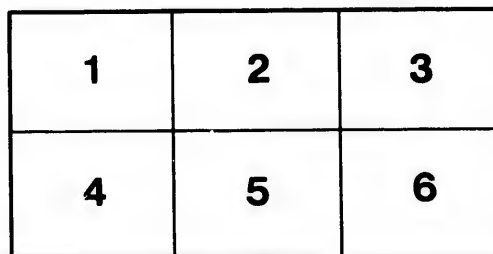
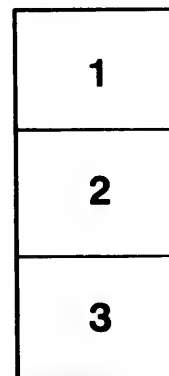
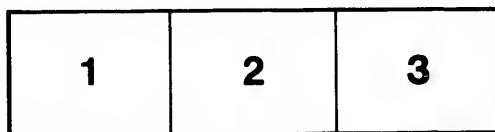
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*THE GESTURE SPEECH OF MAN.*

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ADDRESS

BY

COL. GARRICK MALLERY, U. S. A.

(CHAIRMAN OF SUBSECTION OF ANTHROPOLOGY)

BEFORE THE

AMERICAN ASSOCIATION

FOR THE

ADVANCEMENT OF SCIENCE

AT CINCINNATI, OHIO.

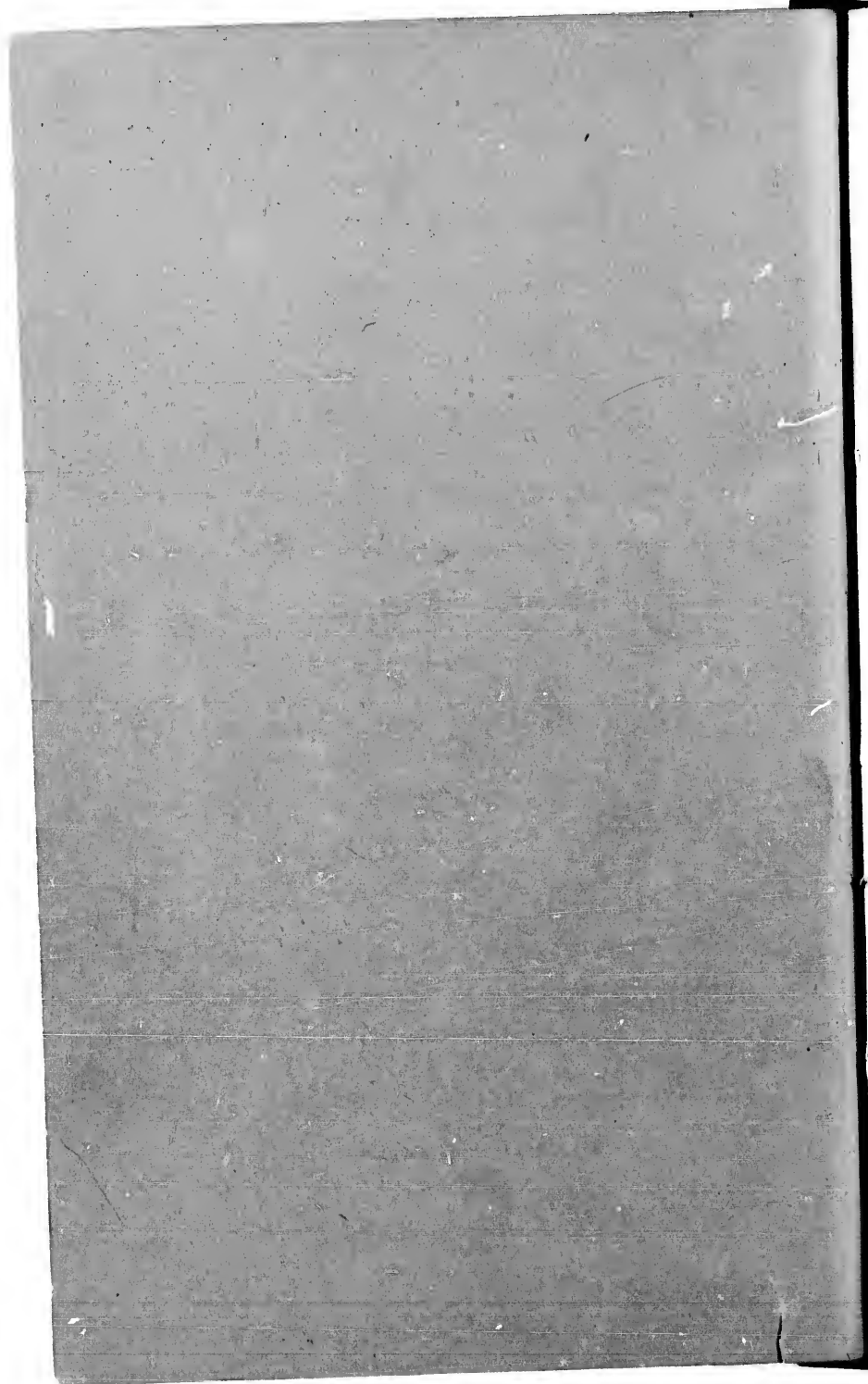
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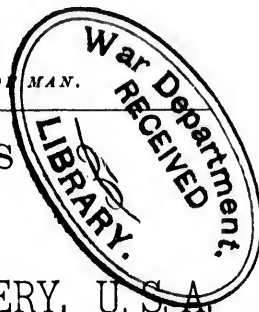
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sued with advantages possessed by few persons even in this country will, on this occasion, be an acceptable contribution as illustrating the gesture speech of man.

So far as the use of gesture signs continued, however originating, in the necessity for communication between peoples of different oral speech, North America shows more favorable conditions for its development than any other thoroughly explored part of the world. In that great continent the pre-columbian population was, as is now believed, scanty, and so subdivided dialectically, that the members of but few bands could readily converse with others. The number of now defined stocks or families of Indian languages within the territory of the United States amounts to sixty-five, and these differ among themselves as radically as each differs from the Hebrew, Chinese, or English. In each of these linguistic families there are several, sometimes as many as twenty, separate languages, which also differ from each other as much as do the English, French, German and Persian divisions of the Aryan linguistic stock.

The conditions upon which the survival of sign language among the Indians has depended are well shown by those attending its discontinuance among certain tribes. The growth of the mongrel tongue, called the Chinook jargon, arising from the same causes that produced the pigeon-English, or *lingua franca* of the Orient, explains the known recent disuse of systematic signs among the Kalapnyas and other tribes of the North Pacific coast. The Alaskan tribes also generally used signs not more than a generation ago. Before the advent of the Russians the coast Alaskans traded their dried fish and oil for the skins and paints of the eastern tribes by visiting the latter, whom they did not allow to come to the coast, and this trade was conducted mainly in sign language. The Russians brought a better market, so the travel to the interior ceased, and with it the necessity for the signs, which therefore gradually died out, and are little known to the present generation on the coast, though still continuing in the interior where the inhabitants are divided by dialects.

No explanation is needed for the gradual disuse of signs for the special purpose of intertribal communication when the speech of surrounding civilization becomes known as the best common medium. When that has become general, and there is a compelled end both to hunting and warfare, signs, as systematically employed

before, fade away, or survive only in formal oratory and impassioned conversation.

## THEORIES ENTERTAINED RESPECTING INDIAN SIGNS.

It is not now proposed to pronounce upon theories. The mere collection of facts cannot, however, be prosecuted to advantage without predetermined rules of direction, nor can they be classified at all without the adoption of some principle which involves a tentative theory. Now, also, since the great principle of evolution has been brought to general notice, no one will be satisfied with knowing a fact without also trying to establish its relation to other facts. Therefore a working hypothesis, which shall not be held to with tenacity, is not only allowable but necessary. It is likewise proper to examine with respect the theories advanced by others.

## NOT CORRELATED WITH MEAGERNESS OF LANGUAGE.

The ever unconfirmed report of travellers that certain languages cannot be clearly understood in the dark by their possessors, using their mother tongue between themselves, when asserted, as it often has been, in reference to any of the tribes of North America, is absolutely false. It must be attributed to the error of visitors, who seldom see the natives except when trying to make themselves intelligible to them by a practice which they have found by experience to have been successful with strangers to their tongue. Captain Burton specially states that the Arapahos possess a very scanty vocabulary, pronounced in a quasi-unintelligible way, and can hardly converse with one another in the dark. The truth is that their vocabulary is by no means scanty, and they do converse with each other with perfect freedom without any gestures when they so please. The same distinguished explorer also gives a story "of a man who, being sent among the Cheyennes to qualify himself for interpreting, returned in a week and proved his competency; all he did, however, was to go through the usual pantomime with a running accompaniment of grunts." And he might as well have omitted the grunts, for obviously he only used sign language.

The similar accusation made against the Shoshonian stock, that their tongue, without signs, was too meager for understanding, is refuted by my own experience. When Ouray, the late head chief of the Utes, was last at Washington, after an interview with the

Secretary of the Interior, he made report of it to the others of the delegation who had not been present. He spoke without pause in his own language for nearly an hour, in a monotone and without a single gesture. The reason for this depressed manner was undoubtedly because he was very sad at the result, involving loss of land and change of home; but the fact remains that full information was communicated on a complicated subject without the aid of a manual sign, and also without even such change of inflection of voice as is common among Europeans. All theories based upon the supposed poverty of American languages must be abandoned.

The grievous accusation against foreign people that they have no intelligible language is venerable and general. With the Greeks the term *ἄλωστος*, "tongueless," was used synonymously with *βάρβαρος*, "barbarian," of all who were not Greek. The name "Slav," assumed by a grand division of the Aryan family, means "the speaker," and is contradistinguished from the other peoples of the world, such as the Germans, who are called in Russian "Njemez," that is, "speechless." In Isalah (xxxiii, 19) the Assyrians are called a people "of a stammering tongue, that one cannot understand." The common use of the expressions "tongueless" and "speechless," so applied, has probably given rise to the mythical stories of actually speechless tribes of savages, and the instances now presented tend to discredit the many other accounts of languages which are incomplete without the help of gesture. The theory that sign language was in whole or in chief the original utterance of mankind would be strongly supported by conclusive evidence to the truth of such travellers' tales, but does not depend upon them. Nor, considering the immeasurable period during which, in accordance with modern geologic views, man has been on the earth, is it probable that any existing peoples can be found among whom speech has not obviated the absolute necessity for gesture in communication between themselves. The signs survive for convenience, used together with oral language, and for special employment when language is unavailable.

#### ITS ORIGIN FROM ONE TRIBE OR REGION.

My correspondents in the Indian country have often contended that sign language was invented by a certain tribe in a particular region from which its knowledge spread among other tribes in-

versely as their distance from, and directly as their intercourse with, the alleged inventors. Unfortunately there is no agreement as to the latter, and probably the accident that the several correspondents met, in certain tribes, specially skilful sign-talkers, determined their opinions. The theory also supposes a comparatively recent origin of sign language, whereas so far as can be traced, the conditions favorable to it existed very long ago and were coëxtensive with the territory of North America occupied by any of the tribes. Some writers confine its use to the Great Plains. It is, however, ascertained to have prevailed among the Iroquois, Wyandots, Ojibwas, and at least three generations back among the Crees and the Mandans and other far northern Dakotas. Some of these and many other tribes of the United States never habiting the Plains, as also the Kutchins of eastern Alaska and the Kutine and Selish of British Columbia, use signs now. Instead of referring to some past period when they did not use signs, many Indians examined speak of a time when they or their fathers employed them more freely and copiously than at present.

Perhaps the most salutary criticism to be offered regarding the theory would be in the form of a query whether sign language has ever been invented by any one body of people at any one time, and whether it is not simply a phase in evolution, surviving and reviving when needed. Not only does the burden of proof rest unfavorably upon the attempt to establish one parent stock for sign language in North America, but it also comes under the stigma now fastened upon the immemorial effort to name and locate the original oral speech of man. It is only next in difficulty to the old persistent determination to decide upon the origin of the whole Indian "race," in which most peoples of antiquity in the eastern hemisphere, including the lost tribes of Israel, the Gipsies, and the Welsh, have figured conspicuously as putative parents.

#### SIGN LANGUAGE NOT UNIFORM.

The general report that there is but one sign language in North America, any deviation from which is either blunder, corruption, or a dialect in the nature of provincialism, originated with sign talkers in several regions. Now a mere sign talker is often a bad authority upon principles and theories. He may not be

liable to the satirical compliment of Dickens' "brave courier," who "understood all languages indifferently ill;" but many men speak some one language fluently, and yet are wholly unable to explain or analyze its words and forms so as to teach it to another, or even to give an intelligent summary or classification of their own knowledge. What such a sign talker has learned is by memorizing, as a child learns English, and though both the sign talker and the child may be able to give some separate items useful to a philologist or foreigner, such items are spoiled when colored by the attempt of ignorance to theorize. A German who has studied English to thorough mastery, except in the mere facility of speech, may in a discussion upon some of its principles be contradicted by any mere English speaker, who insists upon his superior knowledge because he actually speaks the language and his antagonist does not, but the student will probably be correct and the talker wrong. It is an old adage about oral speech that a man who understands but one language understands none. The science of a sign talker possessed by a restrictive theory is like that of Mirabeau, who was greater as an orator than as a philologist, and who on a visit to England gravely argued that there was something seriously wrong in the British mind because the people would persist in saying "give me some bread" instead of "*donnez-moi du pain,*" which was so much easier and more natural. When a sign is presented which such a sign talker has not before seen, he will at once condemn it as bad, just as a United States Minister to Vienna, who had been nursed in the mongrel Dutch of Berks County, Pennsylvania, declared that the people of Germany spoke very bad German.

An argument for the uniformity of the signs of Indians is derived from the fact that those used by any of them are generally understood by others. But signs may be understood without being identical with any before seen. It is a common experience that when Indians find a sign which has become conventional among their tribe not to be understood by an interlocutor, a self-expressive sign is substituted for it, from which a visitor may form the impression that there are no conventional signs. It may likewise occur that the self-expressive sign substituted will be met with by a visitor in several localities, different Indians, in their ingenuity, taking the best and the same means of reaching the exotic intelligence.

There is some evidence that where sign language is now found among Indian tribes it has become more uniform than ever before, simply because many tribes have for some time past been forced to dwell near together at peace. The resulting uniformity in these cases might either be considered as a jargon or as the natural tendency to a compromise for mutual understanding—the unification so often observed in oral speech coming under many circumstances out of former heterogeneity. The rule is that dialects precede languages and that out of many dialects comes one language.

The process of the formation and introduction of signs is the same among Indians as often observed among deaf-mutes. When a number of those unfortunate persons, possessed only of such crude signs as were used by each among his speaking relatives come together for a considerable time, they are at first only able to communicate on a few subjects, but the number of those and the general scope of expression will be continually enlarged. Each one commences with his own conception and his own presentment of it, but the universality of the medium used makes it sooner or later understood. This independent development often renders the first interchange of thought between strangers slow, for the signs must be self-interpreting. There can be no natural universal language which is absolute and arbitrary. When used without convention, as sign language alone of all modes of utterance can be, it must be tentative, experimental, and flexible. The mutes will also resort to the invention of new signs for new ideas as they arise, which will be made intelligible, if necessary, through the illustration and definition given by signs formerly adopted. The fittest signs will in due course be evolved, after rivalry and trial, and will survive. But there may not always be such a preponderance of fitness that all but one of the rival signs shall die out, and some being equal in value to express the same idea or object, will continue to be used indifferently, or as a matter of individual taste, without confusion. A multiplication of the numbers confined together, either of deaf-mutes or of Indians whose speech is diverse, will not decrease the resulting uniformity, though it will increase both the copiousness and the precision of the vocabulary. The Indian use of signs, though maintained by linguistic diversities, is not coincident with any linguistic boundaries. The tendency is to their uniformity among groups



of people who from any cause are brought into contact with each other while still speaking different languages. The longer and closer such contact, while no common tongue is adopted, the greater will be the uniformity of signs.

Some writers take a middle ground with regard to the identity of the sign language of the North American Indians, comparing it with the dialects and provincialisms of the English language, as spoken in England, Ireland, Scotland and Wales. But those dialects are the remains of actually diverse languages, which to some speakers have not become integrated. In England alone the provincial dialects are traceable as the legacies of Saxons, Angles, Jutes, and Danes, with a varying amount of Norman influence. A thorough scholar in the composite tongue, now called English, will be able to understand all the dialects and provincialisms of English in the British Isles, but the uneducated man of Yorkshire is not able to communicate readily with the equally uneducated man of Somersetshire. This is the true distinction. A thorough sign talker would be able to talk with several Indians who have no signs in common, and who, if their knowledge of signs were only memorized, could not communicate with each other. So, also, as an educated Englishman will understand the attempts of a foreigner to speak in very imperfect and broken English, a good Indian sign-expert will apprehend the feeblest efforts of a tyro in gestures. But the inference that there is but one true Indian sign language, just as there is but one true English language, is not correct unless it can be shown that a much larger proportion of the Indians who use signs at all, than present researches show to be the case, use identically the same signs to express the same ideas. It would also seem necessary to the parallel that the signs so used should be absolute, if not arbitrary, as are the words of an oral language, and not independent of preconcert and self-interpreting at the instant of their invention or first exhibition, as all true signs must originally have been and still measurably remain.

#### ARE SIGNS CONVENTIONAL OR INSTINCTIVE?

There has been much discussion on the question whether gesture signs were originally invented, in the strict sense of that term, or whether they result from a natural connection between

them and the ideas represented by them, that is, whether they are conventional or instinctive. Cardinal Wiseman (*Essays*, III, 537) thinks they are of both characters; but referring particularly to the Italian signs and the proper mode of discovering their meaning, he observes that they are used primarily with words and form the usual accompaniment of certain phrases. "For these the gestures become substitutes, and then by association express all their meaning, even when used alone." This would be the process only where systematic gestures had never prevailed or had been so disused as to be forgotten, and were adopted after elaborate oral phrases and traditional oral expressions had become common. Sign language as a product of evolution has been developed rather than invented, and yet it seems probable that each of the separate signs, like the several steps that lead to any true invention, had a definite origin arising out of some appropriate occasion, and the same sign may in this manner have had many independent origins due to identity in the circumstances, or, if lost, may have been reproduced.

Another form of the query is whether signs are arbitrary or natural. An unphilosophic answer will often be made in accordance with what the observer considers to be natural to himself. A common sign among both deaf-mutes and Indians for *woman* consists in designating the arrangement of the hair, but such a represented arrangement of hair familiar to the gesturer as had never been seen by the person addressed would not seem "natural" to the latter. It would be classed as arbitrary, and could not be understood without context or explanation, indeed without translation such as is required from foreign oral speech. Signs most naturally, that is appropriately, expressing a conception of the thing signified, are first adopted from circumstances of environment, and afterwards modified so as to appear, without full understanding, conventional and arbitrary, yet they are as truly "natural" as the signs for hearing, seeing, eating, and drinking, which continue all over the world as they were first formed because there is no change in those operations.

Perhaps no signs in common use are in their origin conventional. What appears to be conventionality largely consists in the form of abbreviation which is agreed upon. When the signs of the Indians have from ideographic form become demotic, they may be roughly called conventional, but still not arbitrary.

## SOME NATURAL SIGNS CONVENTIONALIZED.

But while all Indians, as all gesturing men, have many natural signs in common, they use many others which have become conventional in the sense that their origin and conception are not now known or regarded by the persons using them. The conventions by which the latter were established occurred during long periods, when the tribes forming them were so separated as to have established altogether diverse customs and mythologies, and when the several tribes were exposed to such different environments as to have formed varying conceptions needing appropriate sign expression. The old error that the North American Indians constitute one homogeneous race is now abandoned. Nearly all the characteristics once alleged as segregating them from the rest of mankind have proved not to belong to the whole of the pre-Columbian population, but only to those portions of it first explored. The practice of scalping is not now universal, if it ever was, even among the tribes least influenced by civilization, and therefore the cultivation of the scalp-lock separated from the rest of the hair of the head, or with the removal of all other hair, is not a general feature of their appearance. The arrangement of the hair is so different among tribes as to be one of the most convenient modes for their pictorial distinction. The war paint, red in some tribes, was black in others; the mystic rites of the calumet were in many regions unknown, and the use of wampum was by no means extensive. The wigwam is not the type of native dwellings, which show as many differing forms as those of Europe. In color there is a great variety, and even admitting that the term "race" is properly applied, no competent observer would characterize it as red, still less copper-colored. Some tribes differ from each other in all respects nearly as much as either of them do from the lazzaroni of Naples, and more than either do from certain tribes of Australia. It would therefore be expected, as is the case, that the conventional signs of different stocks and regions differ as do the words of English, French and German, which, nevertheless, have sprung from the same linguistic roots. No one of those languages is a dialect of any of the others; and although the sign systems of the several tribes have greater generic unity with less specific variety than oral languages, no one of them is necessarily the dialect of any other. To insist that sign language is uniform

were to assert that it is perfect — "That faultless monster that the world ne'er saw."

## GENERAL ANCIENT USE OF THE SYSTEM IN N. A.

The supposition that the systematic use of signs once existed among all Indian tribes receives support from the fact that in nearly all instances where such existence has been at first denied, further research has discovered the remains, even if not the practice, of sign language. This has been even among tribes long exposed to European influence and officially segregated from all others. Collections have been obtained from the Iroquois, Ojibwas, Alaskans, Apaches, Zuñi, Pimas, Papagos and Maricopas, after army officers, missionaries, Indian agents and travellers had denied them to be possessed of any knowledge on the subject.

One of the most interesting proofs of the general knowledge of sign language, even when seldom used, was given in the visit of five Jicarilla Apaches to Washington in April, 1880, under the charge of their agent. The latter said he had never heard of any use of signs among them. But it happened that there was a delegation of Absaroka (Crows) at the same hotel, and the two parties, from regions one thousand miles apart, not knowing a word of each other's language, immediately began to converse in signs, resulting in a decided sensation. One of the Crows asked the Apaches whether they ate horses, and it happening that the sign for *eating* was misapprehended for that known by the Apaches for *many*, the question was supposed to be whether the latter had many horses, which was answered in the affirmative. Thence ensued a misunderstanding on the subject of hippophagy, which was curious both as showing the general use of signs as a practice and the diversity in special signs for particular meanings. The surprise of the agent at the unsuspected accomplishment of his charges was not unlike that of a hen which, having hatched a number of duck eggs, is perplexed at the instinct with which the brood takes to the water.

The denial of the use of signs is sometimes faithfully though erroneously reported from the distinct statements of Indians to that effect. In that, as in other matters, they are often provokingly reticent about their old habits and traditions. Chief Onray asserted to me, that his people, the Utes, had not the practice of

sign talk, and had no use for it. This was much in the proud spirit in which an Englishman would have made the same statement, as the idea involved an accusation against the civilization of his people, whom he wished to appear highly advanced. Within the same week I took seven Utes, members of the delegation then with Ouray, to the National Deaf-Mute College, and they showed not only perfect familiarity with, but expertness in, signs.

The studies thus far pursued lead to the conclusion that at the time of the discovery of North America all its inhabitants practised sign language, though with different degrees of expertness; and that, while under changed circumstances, it was disused by some, others, especially those who after the acquisition of horses became nomads of the Great Plains, retained and cultivated it to the high development now attained.

#### PERMANENCE OF SIGNS.

It is important to inquire into the permanence of particular gesture signs to express a special idea or object when the system has been long continued. The gestures of classic times are still in use by the modern Italians with the same signification; indeed the former, on Greek vases or reliefs, or in Herenlauean bronzes, can only be interpreted by the latter. In regard to the signs of instructed deaf-mutes in this country there appears to be a permanence beyond expectation. A pupil of the Hartford Institute half a century ago lately stated that the signs used by teachers and pupils at Hartford, Philadelphia, Washington, Council Bluffs and Omaha, were nearly the same as he had learned. "We still adhere to the old sign for President from Monroe's three-cornered hat, and for governor we designate the cockade worn by that dignitary on grand occasions three generations ago."

Specific comparisons made of the signs reported by the Prince of Wied, in 1832, with those now used by the same tribes from whom he obtained them, show a remarkable degree of permanence. If they have persisted for half a century their age is probably much greater. In general it is believed that signs, constituting as they do a natural mode of expression, though enlarging in scope as new ideas and new objects require to be included and though abbreviated variously, do not readily change in their essentials.

I do not present any Indian signs as precisely those of primitive man, not being so carried away by enthusiasm as to suppose them possessed of immutability and immortality not found in any other mode of human utterance. Signs as well as words, animals, and plants have had their growth, development and change, their births and deaths, and their struggle for existence with survival of the fittest. Yet when signs, which are general among Indian tribes, are also prevalent in other parts of the world, they probably are of great antiquity. The use of derivative meanings to a sign only enhances this presumption. At first there might not appear to be any connection between the ideas of *same* and *wife*, expressed by the sign of horizontally extending the two forefingers side by side. The original idea was doubtless that given by the Welsh captain in Shakspeare's *Henry V*: " 'Tis so like as my fingers is to my fingers;" and from this similarity comes "equal," "companion," and subsequently the close life-companion "wife." The sign is used in each of these senses by different Indian tribes, and sometimes the same tribe applies it in all of the senses as the context determines. It appears also in many lands with all the significations except that of "wife."

Many signs but little differentiated were unstable, while others that have proved the best modes of expression have survived as definite and established. A note may be made in this connection of the large number of diverse signs for *horse*, all of which must have been invented within a comparatively recent period, and the small variation in the signs for *dog*, which are probably ancient.

#### IS THE INDIAN SYSTEM SPECIAL AND PECULIAR?

While denying the uniformity of Indian signs, it is proper to inquire whether their system, as a whole, is special and peculiar to themselves. This may be determined by comparing that system with those of other peoples and of deaf-mutes.

#### COMPARISONS WITH FOREIGN SIGNS.

My researches during several years show a surprising number of signs for the same idea which are substantially identical, not only among savage tribes, but among all peoples that use gesture

signs with any freedom. Men, in groping for a mode of communication with each other, and using the same general methods, have been under many varying conditions and circumstances which have determined differently many conceptions and their semiotic execution, but there have also been many of both which were similar. North American Indians have no special superstition concerning the evil-eye like the Italians, nor have they been long familiar with the jackass so as to make him, with more or less propriety, emblematic of stupidity; therefore signs for those concepts are not cisatlantic, but many are substantially in common between our Indians and Italians. Many other Indian signs are identical, not only with those of the Italians and the classic Greeks and Romans, but of other peoples of the Old World, both savage and civilized. The generic uniformity is obvious, while the occasion of specific varieties can be readily understood.

The same remark applies to the collections of signs already obtained by correspondence from among the Turks, Armenians and Koords, the Bushmen of Africa, the Fijians, the Redjangs and Lelongs of Sumatra, the Chinese and the Australians. The results of researches in Ceylon, India, South America and several other parts of the world, are not yet sufficient to allow of their classification. Much interesting material is expected from inquiries recently instituted through the medium of Mr. Hyde Clarke, Vice President of the Anthropological Institute of Great Britain and Ireland, into the sign language of the mutes of the Seraglio at Constantinople. That they had a system of communication was noticed by Sibscota, in 1670, without his giving any details. It appears not only to be known to the inmates themselves, but to high officials, eunuchs and other persons connected with the Sublime Porte. As it is supposed that the Osmanli Sultans followed the Byzantine emperors in the employment of mutes, and that they adopted them from Persian kings, it is possible that the signs, now in systematic, though limited, use, have been regularly transmitted from high oriental antiquity.

#### COMPARISON WITH DEAF-MUTE SIGNS.

The Indians who have been brought to the eastern states have often held happy intercourse by signs with white deaf-mutes, who surely have no semiotic code preconcerted with any of the plain-

roamers. While many of their signs were identical, and all sooner or later were mutually understood, it has been noticed that the signs of the deaf-mutes were more readily understood by the Indians than were theirs by the deaf-mutes, and that the latter greatly excelled in pantomimic effect. What is to the Indian a mere adjunct or accomplishment is to the deaf-mute the natural mode of utterance. The "action, action, action," of Demosthenes is their only oratory, not mere heightening of it, however valuable.

The result of the comparisons is that the so-called sign language of Indians is not properly speaking one language, but that it and the gesture systems of deaf-mutes and of all peoples constitute together one language—the gesture speech of mankind—of which each system is a dialect.

#### GESTURES AIDING ARCHEOLOGICAL RESEARCH.

The most interesting light in which the Indians of North America can be regarded is in their present representation of a stage of evolution once passed through by our own ancestors. Their signs, as well as their myths and customs, form a part of the paleontology of humanity to be studied in the history of the latter, as the geologist, with similar object, studies all the strata of the physical world. At this time it is only possible to state that gesture signs have been applied to elucidate pictographs, and also to discover religious, sociologic, and historic ideas preserved in themselves, as has been done with great success in the radicals of oral speech.

#### SIGNS CONNECTED WITH PICTOGRAPHS.

The picture writing of Indians is the sole form in which they recorded events and ideas that can ever be interpreted without the aid of a traditional key, such as is required for the signification of the wampum belts of the northeastern tribes and the *quipus* of Peru. Strips of bark, tablets of wood, dressed skins of animals, and the smooth surfaces of rocks have been and still are used for such records, those most ancient, and therefore most interesting, being the rock etchings; but they can only be deciphered by the ascertained principles on which the more modern and obvious are made. Many of the widespread rock carvings



are mere idle sketches of natural objects, mainly animals, and others are as strictly mnemonic as is the wampum. But where there has existed a rude form of graphic representation, and at the same time a system of ideographic gesture signs prevailed, it would be expected that the form of the latter would appear in the former. That this is the fact among North American Indians will be shown in a paper to be read before the section by my collaborator Dr. W. J. Hoffman, and at greater length in a report by myself to form part of the first Annual Report of the Bureau of Ethnology, now in press. This fact is of great archeologic importance, as the reproduction of gesture lines in the pictographs made by Indians has, for obvious reasons, been most frequent in the attempt to convey those subjective ideas which were beyond the range of an artistic skill limited to the direct representation of objects, so that the part of the pictographs which is the most difficult of interpretation is the one which the study of sign language can elucidate. Traces of the same signs used by Indians found in the ideographic pictures of the Egyptians, and in Chinese and Aztec characters, are also exhibited by illustrations in the Report above mentioned.

#### HISTORY OF GESTURE LANGUAGE.

There is ample evidence of record, besides that derived from other sources, that the systematic use of gesture speech was of great antiquity. Livy so declared, and Quintilian specifies that the "*lex gestus \* \* \* ab illis temporibus heroicis orta est.*" Athenians tells that gestures were reduced to distinct classification with appropriate terminology. One of these classes was adapted by Bathyllus to pantomime.

While the general effect of the classic pantomimes is often mentioned, there remain but few detailed descriptions of them. Apuleius, however, in his *Metamorphosis* gives sufficient details of the performance of the Judgment of Paris to show that it resembled the best form of modern ballet opera. The popularity of these exhibitions continued until the sixth century, and it is evident from a decree of Charlemagne that they were not lost, or, at least, had been revived in his time. Those of us who have enjoyed the performance of the original Ravel troupe will admit that the art still survives, though not with the magnificence or perfection,

especially with reference to serious subjects, which it exhibited in the age of imperial Rome.

Quintilian gave most elaborate rules for gestures in oratory, which are specially noticeable from the importance attached to the manner of disposing the fingers. He attributed to each particular disposition a significance or suitability which is not now obvious. The value of these digital arrangements is, however, exhibited by their use among the modern Italians, to whom they have directly descended. Their curious elaboration appears in the volume by the canon Andrea de Jorio, *La Mimica degli Antichi investigata nel Gestire Napoletano, Napoli, 1832*. The canon's chief object was to interpret the gestures of the ancients as exhibited in their works of art and described in their writings, by the modern gesticulations of the Neapolitans, and he has shown that the general system of gesture once prevailing in ancient Italy is substantially the same as now observed. With an understanding of the existing language of gesture the scenes on the most ancient Greek vases and reliefs obtain a new and interesting significance and form a connecting link between the present and prehistoric times.

#### USE BY MODERN ACTORS.

Less of practical value can be learned of sign language, considered as a system, from the study of the gestures used by actors, than would appear without reflection. The pantomimist, indeed, who uses no words whatever, is obliged to avail himself of every natural or imagined connection between thought and gesture, and depending wholly upon the latter, makes himself intelligible. With speaking actors, however, words are the main reliance, and gestures generally serve for rhythmic movement and to display personal grace.

When many admirers of Ristori, who were wholly unacquainted with the language in which her words were delivered, declared that her gesture and expression were so perfect that they understood every sentence, it is to be doubted if they would have been so delighted if they had not been thoroughly familiar with the plots of Queen Elizabeth and Mary Stuart. This view is confirmed by the case of a deaf-mute, known to me, who had prepared to enjoy Ristori's acting by reading in advance the advertised play,

but on his reaching the theatre another play was substituted and he could derive no idea from its presentation. A crucial test on this subject was made at the representation at Washington last April, of *Fron-Fron* by Sara Bernhardt and the excellent French company supporting her. Several persons of special intelligence and familiar with theatrical performances, but who did not understand spoken French, and had not heard or read the play or even seen an abstract of it, paid close attention to ascertain what they could learn of the plot and incidents from the gestures alone. This could be determined in the special play the more certainly as it is not founded on historic events or any known facts. The result was that from the entrance of the heroine during the first scene in a peacock-blue riding habit to her death in a black walking-suit, three hours or five acts later, none of the students formed any distinct conception of the plot. This want of apprehension extended even to uncertainty whether *Gilberte* was married or not; that is, whether her adventures were those of a disobedient daughter or a faithless wife, and, if married, which of the half dozen male personages was her husband. There were gestures enough, indeed rather a profusion of them, and they were thoroughly appropriate to the words (when those were understood) in which fun, distress, rage, and other emotions were expressed, but in no cases did they interpret the motive for those emotions. They were the dressing for the words of the actors as the superb millinery was that of their persons, and perhaps acted as varnish to bring out dialogues and soliloquies in heightened effect. But though varnish can bring into plainer view dull or faded characters, it cannot introduce into them significance where none before existed. The simple fact was that the gestures of the most famed histrionic school, the Comédie Française, were not significant, far less self-interpreting, and though praised as the perfection of art, have diverged widely from nature.

However numerous and correct may be the actually significant gestures made by a great actor in the representation of his part, they must be in small proportion to the number of gestures not at all significant, and which are no less necessary to give to his declamation precision, grace and force. Histrionic perfection is, indeed, more shown in the slight shades of movement of the head, glances of the eye, and poises of the body than in violent attitudes; but these slight movements are wholly unintelligible apart

from the words uttered with them. Even in the expression of strong emotion the same gesture will apply to many and utterly diverse conditions of fact. Its fitness consists in being the same which the hearer of the expository words would spontaneously assume if yielding to the same emotions, and which therefore by association tends to induce a sympathetic yielding. The greatest actor in telling that his father was dead can convey his grief with a shade of difference from that which he would use if saying that his wife had run away, his son been arrested for murder, or his house burned down; but that shade would not without words inform any person, ignorant of the supposed event, which of the four misfortunes had occurred. A true sign language, however, would fully express the exact circumstances, either with or without any exhibition of the general emotion appropriate to them.

Even among the best sign-talkers, whether Indian or deaf-mute, it is necessary to establish some *rapport* relating to theme or subject-matter, since many gestures, as indeed is the case in a less degree with spoken words, have widely different significations, according to the object of their exhibition, as well as the context. Rabelais (*Pantagruel*, Book III, ch. xiv) hits the truth upon this point, however ungallant in his application of it to the fair sex. Panurge is desirous to consult a dumb man, but says it would be useless to apply to a woman, for "whatever it be that they see they do always represent unto their fancies, and imagine that it hath some relation to love. Whatever signs, shows or gestures, we shall make, or whatever our behavior, carriage or demeanor, shall happen to be in their view and presence, they will interpret the whole in reference to androgynation." A story is told to the same point by Guevara, in his fabulous life of the Emperor Marcus Aurelius. A young Roman gentleman encountering at the foot of Mount Celion a beautiful Latin lady, who from her very cradle had been deaf and dumb, asked her in gesture what senators in her descent from the top of the hill she had met with, going up thither. She straightway imagined that he had fallen in love with her and was eloquently proposing marriage, whereupon she at once threw herself into his arms in acceptance. The experience of travellers of the Plains is to the same general effect, that signs commonly used to men are understood by women in a sense so different as to occasion embarrassment.

## RESULTS SOUGHT IN THE STUDY OF SIGN LANGUAGE.

These may be divided into (1) its practical application, (2) its aid to philologic researches, and (3) its archaeological relations.

## PRACTICAL APPLICATION.

The most obvious application of sign language will for its practical utility depend upon the correctness of the view submitted that it is not a mere semaphoric repetition of motions to be memorized from a limited traditional list, but is a cultivable art, founded upon principles which can be readily applied by travellers. This advantage is not merely theoretical, but has been demonstrated to be practical by a professor in a deaf mute college who, lately visiting several of the wild tribes of the plains, made himself understood among all of them without knowing a word of any of their languages, and by another who had a similar experience in Italy and southern France. It must, however, be observed that the use of signs is only of great assistance in communicating with foreigners, whose speech is not understood, when both parties agree to cease all attempt at oral language, relying wholly upon gestures. So long as words are used at all, signs will be made only as their accompaniment, and they will not always be ideographic.

## POWERS OF SIGNS COMPARED WITH SPEECH.

Sign language is superior to all others in that it permits every one to find in nature an image to express his thoughts on the most needful matters intelligibly to any other person. The direct or substantial natural analogy peculiar to it prevents a confusion of ideas. It is possible to use words without understanding them which yet may be understood by those addressed, but it is hardly possible to use signs without full comprehension of them. Separate words may be comprehended by persons hearing them without the whole connected sense of the words taken together being caught, but signs are more intimately connected. Even those most appropriate will not be understood if the subject is beyond

the comprehension of their beholders. They would be as unintelligible as the wild clicks of his instrument, in an electric storm, would be to the telegrapher, or as the semaphore, driven by wind, to the signalist. In oral speech even onomatopoes are arbitrary, the most strictly natural sounds striking the ear of different individuals and nations in a manner wholly diverse. The instances given by Sayce are in point. Exactly the same sound was intended to be reproduced in the "*bilbit* amphora" of Nævins, the "*glut glut* murmurat mda sonans" of the Latin Anthology, and the "*puls*" of Varro. The Persian "*bulbul*," the "*jugjug*" of Gascoigne, and the "*whitwhit*" of others are all attempts at imitating the note of the nightingale. But successful signs must have a much closer analogy and establish a concord between the talkers far beyond that produced by the mere sound of words. The merely emotional sounds or interjections may be advantageously employed in connection with merely emotional gestures, but whether with or without them, they would be useless for the explicit communication of facts and opinions of which signs by themselves are capable. The combinations which can be made by signs are infinite and their enthusiastic teachers may be right in claiming that if they had been elaborated by the secular labor devoted to spoken language, man could, by his hands, arms and fingers, with facial and bodily accentuation, express any idea that could be conveyed by words. As, however, sign language has been chiefly used during historic time either as a scaffolding around a more valuable structure, to be thrown aside when the latter was completed, or as an occasional substitute, such development was not to be expected.

A comparison sometimes drawn between sign language and that of the North American Indians, founded on the statement of their common poverty in abstract expressions, is not just to either. Deeper study into Indian tongues has ascertained that they are by no means so confined to the concrete as was once believed, and the process of forming signs to express abstract ideas is only a variant from that of oral speech, in which the words for the most abstract ideas, such as law, virtue, infinitude, and immortality, are shown by Max Müller to have been derived and deduced, that is, abstracted, from sensuous impressions. This is done by selecting what is and rejecting what is not in common to the concrete ideas. Concepts of the intangible and invisible are only learned through

precepts of tangible and visible objects, whether finally expressed to the eye or to the ear, in terms of sight or of sound. In the use of signs the countenance and manner as well as the tenor decide whether objects themselves are intended, or the forms, positions, qualities, and motions of other objects which are suggested; and signs for moral and intellectual ideas, founded on analogies, are common all over the world as well as among deaf-mutes. The very concepts of *plurality*, *momentum* and *righteousness*, selected by Tylor as the result of combined and compared thought which requires words, can be clearly expressed by signs, and it is not understood why those signs could not have attained their present abstract significance through the thoughts arising from the combination and comparison of other signs, without the actual intervention of words.

The elements of sign language are natural and universal, by recurring to which the less natural signs adopted dialectically or for expedition can always, with some circumlocution, be explained. This power of interpreting itself is a peculiar advantage over spoken languages, which, unless explained by gestures or indications, can only be interpreted by means of some other spoken language. When highly cultivated, its rapidity on familiar subjects exceeds that of speech and approaches to that of thought itself. This statement may be startling to those who do not consider that oral speech is now wholly conventional, and that with the similar development of sign language conventional expressions with hands and body could be made more quickly than with the vocal organs, because more organs could be worked at once. At the same time it must be admitted that great increase in rapidity is chiefly obtained by a system of preconcerted abbreviations, and by the adoption of absolute forms, in which naturalness is sacrificed and conventionality established, as has been the case with all spoken languages in the degree in which they have become copious and convenient.

There is another characteristic of the gesture speech that, though it cannot be resorted to in the dark, nor where the attention of the person addressed has not been otherwise attracted, it has the countervailing benefit of use when the voice cannot be employed. This may be an advantage at a distance which the eye can reach, but not the ear, and still more frequently when silence or secrecy is desired. Dalgarno recommends it for use

in the presence of great people, who ought not to be disturbed, and curiously enough "Disappearing Mist," the Iroquois chief, speaks of the former extensive employment of signs in his tribe by women and boys as a mark of respect to warriors and elders, their voices, in the good old days, not being uplifted in the presence of the latter. The decay of that wholesome state of discipline, he thinks, accounts partly for the disappearance of the use of signs among the modern impudent youth and the dusky claimants of woman's rights.

## RELATIONS TO PHILOLOGY.

The aid to be derived from the study of sign language in prosecuting researches into the science of philology was pointed out by Leibnitz, in his *Collectanea Etymologica*, without hitherto exciting any thorough or scientific work in that direction, the obstacle to it probably being that scholars competent in other respects had no adequate data of the gesture speech of man to be used in comparison. The latter will, it is hoped, be supplied by the work now undertaken by me, under the direction of the Bureau of Ethnology, which extends to the collection and collation of signs from all parts of the world as well as those of North American Indians.

It is generally admitted that signs played an important part in giving meaning to spoken words, and that many primordial roots of language have been founded in the involuntary sounds accompanying certain actions. As, however, the action was the essential, and the concomitant or consequent sound the accident, it would be expected that a representation or feigned reproduction of the action would have been used to express the idea before the sound associated with that action would have been separated from it. Philology, therefore, comparing the languages of earth in their radicals, must henceforth include the graphic or manual presentation of thought, and compare the elements of ideography with those of phonics. Etymology now examines the ultimate roots, not the fanciful resemblances between oral forms, in the different tongues; the internal, not the mere external parts of language. A marked peculiarity of sign language consists in its limited number of radicals and the infinite combinations into which those radicals enter while still remaining



distinctive. It is therefore a proper field for etymologic study.

It is possible to ascertain the included gesture even in many English words. The class represented by the word *supercilious* will occur to all, but one or two examples may be given not so obvious and more immediately connected with the gestures of Indians. *Imbecile*, generally applied to the weakness of old age, is derived from the Latin *in*, in the sense of on, and *bacillum*, a staff, which at once recalls the Cheyenne sign for *old man*, viz.: holding the right hand forward, bent at elbow with the fist closed sidewise, as if holding a staff. So *time* appears more nearly connected with the Greek *τείνω*, to stretch, when information is given of the sign for *long time*, viz.: placing the thumbs and forefingers as if a small thread were held between the thumb and forefinger of each hand, the hands first touching each other, and then slowly moving apart, as if *stretching* a piece of gum-elastic.

Some special resemblances exist between the language of signs and the character of the oral languages found on this continent. Dr. J. Hammond Trumbull remarks of the composition of the words that they were "so constructed as to be thoroughly self-defining and immediately intelligible to the hearer." In another connection the remark is further enforced. "Indeed, it is a requirement of the Indian languages that every word shall be so framed as to admit of immediate resolution to its significant elements by the hearer. It must be thoroughly *self-defining*, for (as Max Müller has expressed it) 'it requires tradition, society, and literature to maintain words which can no longer be analyzed at once.' \* \* \* In the ever-shifting state of a nomadic society no debased coin can be tolerated in language, no obscure legend accepted on trust. The metal must be pure and the legend distinct."

Indian languages, like those of higher development, sometimes exhibit changes of form by the permutation of vowels, but often an incorporated particle, whether suffix, affix, or infix, shows the etymology which often, also, exhibits the same objective conception that would be executed in gesture. There are, for instance, different forms for standing, sitting, lying, falling, and for standing, sitting, lying on or falling from the same level or a higher or lower level. This resembles the pictorial conception and execution of signs.

Indian languages exhibit the same fondness for demonstration

which is necessary in sign language. The two forms of utterance are alike in their want of power to express certain words, such as the verb "to be," and in the criterion of organization, so far as concerns a high degree of synthesis and imperfect differentiation, they bear substantially the same relation to the English language.

It may be added that as not only proper names but nouns generally in Indian languages are connotive, predicating some attribute of the object, they can readily be expressed by gesture signs, and therefore among them, relations may be established between the words and the signs. Such have also been noticed, especially by my valued correspondent, Mr. Hyde Clarke, to exist between signs and the words of old Asiatic and African languages, showing the same operation of conditions in the same psychologic horizon.

#### DIVISIONS OF GESTURE SPEECH.

Gesture speech is composed of corporeal motion and facial expression. An attempt has been made by some writers to discuss these general divisions separately, and its success would be practically convenient if it were always understood that their connection is so intimate that they can never be altogether severed. A play of feature, whether instinctive or voluntary, accentuates and qualifies all motions intended to serve as signs, and strong instinctive facial expression is generally accompanied by action of the body or some of its members. But, so far as a distinction can be made, expressions of the features are the result of emotional, and corporeal gestures, of intellectual action. The former in general and the small number of the latter that are distinctively emotional are nearly identical among men from physiological causes which do not affect with the same similarity the processes of thought. The large number of corporeal gestures expressing intellectual operations require and admit of more variety and conventionality. Thus the features and the body among all mankind act almost uniformly in exhibiting fear, grief, surprise and shame, but all objective conceptions are varied and variously portrayed. Even such simple indications as those for "no" and "yes" appear in several different motions. While, therefore, the terms sign language and gesture speech necessarily include and suppose facial expression when emotions are in ques-

tion, they refer more particularly to corporeal motions and attitudes. For this reason much of the valuable contribution of Darwin in his *Expression of the Emotions in Man and Animals* is not directly applicable to sign language. His analysis of emotional gestures into those explained on the principles of serviceable associated habits, of antithesis, and of constitution of the nervous system, should, nevertheless, always be remembered. The earliest gestures were doubtless emotional, preceding those of a pictorial, metaphoric, and, still subsequent, conventional character.

#### THE ORIGIN OF SIGN LANGUAGE.

When examining into the origin of sign language through its connection with that of oral speech, it is necessary to be free from the vague popular impression that some oral language, of the general character of that now used among mankind, is "natural" to mankind. It will be admitted that all the higher oral languages were at some past time less opulent and comprehensive than they are now, and as each particular language has been thoroughly studied it has become evident that it grew out of some other and less advanced form.

Oral language consists of variations and mutations of vocal sounds produced as signs of thought and emotion. But it is not enough that those signs should be available as the vehicle of the producer's own thoughts. They must be also efficient for the communication of such thoughts to others. It has been, until of late years, generally held that thought was not possible without oral language, and that, as man was supposed to have possessed from the first the power of thought, he also from the first possessed and used oral language substantially as at present. That the latter, as a special faculty, formed the main distinction between man and the brutes, has been and still is the prevailing doctrine. It may, however, be doubted if there is any more necessary connection between ideas and sounds, the mere signs of thought that strike the ear, than there is between the same ideas and signs addressed only to the eye.

The point most debated for centuries has been, not whether there was any primitive oral language, but what that language was. Some literalists have indeed argued from the Mosaic nar-

rative that the primitive language had been taken away as a disciplinary punishment, as the Paradisiac Eden had been earlier lost, and that, therefore, the search for it was as fruitless as to attempt the passage of the flaming sword. More liberal Christians have been disposed to regard the Babel story as allegorical, if not mythical, and have considered it to represent the disintegration of tongues out of one which was primitive. Though its quest has led into error, it has, like those of the philosopher's stone, of perpetual motion and of other phantasms in other directions of thought, been of great indirect utility. It has stimulated philologic science, the advance of which has successively shifted back the postulated primitive language from Hebrew to Sanscrit, thence to Aryan, and now it is attempted to evoke from the vasty deeps of antiquity the ghosts of other rival claimants for precedence in dissolution.

The discussion is now, however, varied by the suggested possibility that man at some time may have existed without any oral language. It is of late conceded that mental images or representations can be formed without any connection with sound, and may at least serve for thought, if not for expression. It is certain that concepts, however formed, can be expressed by other means than sound. One mode of this expression is by gesture, and there is less reason to believe that gestures commenced as the interpretation of or substitute for words, than that the latter originated in and served to translate gestures. Many arguments have been advanced to prove that gesture language preceded articulate speech and formed the earliest attempt at communication, resulting from the interacting subjective and objective conditions to which primitive man was exposed. Some of the facts on which deductions have been based, made in accordance with well-established modes of scientific research from study of the lower animals, children, individuals in mental disorder or isolated from their fellows, and the lower types of mankind, are of great interest, but it is only possible now to examine those relating to deaf-mutes.

#### UNINSTRUCTED DEAF-MUTES.

The signs made by congenital and uninstructed deaf-mutes are either those originating in or invented by individuals, or those of

a colloquial character used by such mutes where associated. The accidental or merely suggestive signs peculiar to families, one member of which happens to be a mute, are too much affected by the other members of the family to be of certain value. Those, again, which are taught in institutions have become conventional and were designedly adapted to translation into oral speech, although founded by the abbé de l'Épée, followed by the abbé Sicard, in the natural signs first above mentioned.

A great change has doubtless occurred in the estimation of congenital deaf-mutes since the Justinian Code which consigned them forever to legal infancy, as incapable of intelligence, and classed them with the insane. Yet most modern writers, for instance, Archbishop Whately and Max Müller, have declared that deaf-mutes could not think until after having been instructed. It cannot be denied that the deaf-mute thinks after his instruction either in the ordinary gesture signs or in the finger alphabet, or more lately in artificial speech. By this instruction he has become master of a highly-developed language, such as English or French, which he can read, write, and actually talk, but that foreign language he has obtained through the medium of signs. This is a conclusive proof that signs constitute a real language and one which admits of thought, for no one can learn a foreign language unless he had some language of his own, whether by descent or acquisition, by which it could be translated, and such translation into the new language could not even be commenced unless the mind had been already in action and intelligently using the original language for that purpose. In fact the use by deaf-mutes of signs originating in themselves exhibits a creative action of mind and innate faculty of expression beyond that of ordinary speakers who acquired language without conscious effort.

#### GESTURES OF FLUENT TALKERS.

The command of a copious vocabulary common to both speaker and hearer undoubtedly tends to a phlegmatic delivery and disdain of subsidiary aid. An excited speaker will, however, generally make a free use of his hands without regard to any effect of that use upon auditors. Even among the gesture-hating English, when they are aroused from torpidity of manner, the hands are involuntarily clapped in approbation, rubbed with delight, wrung

in distress, raised in astonishment, and waved in triumph. The fingers are snapped for contempt, the forefinger is vibrated to reprove or threaten, and the fist shaken in defiance. The brow is contracted with displeasure, and the eyes winked to show connivance. The shoulders are shrugged to express disbelief or repugnance, the eyebrows elevated with surprise, the lips bitten in vexation and thrust out in sullenness or displeasure. Quintilian becomes eloquent on the variety of motions of which the hands alone are capable.

"The action of the other parts of the body assists the speaker, but the hands speak themselves. By them do we not demand, promise, call, dismiss, threaten, supplicate, express abhorrence and terror, question and deny? Do we not by them express joy and sorrow, doubt, confession, repentance, measure, quantity, number, and time? Do they not also encourage, supplicate, restrain, convict, admire, respect?"

#### NATURAL PANTOMIME.

In the earliest part of man's history the subjects of his discourse must have been almost wholly sensuous, and therefore readily expressed in pantomime. Not only was pantomime sufficient for all the actual needs of his existence, but it is not easy to imagine how he could have used language such as is now known to us. If the best English dictionary and grammar had been miraculously furnished to him, together with the art of reading with proper pronunciation, the gift would have been valueless, because the ideas expressed by the words had not yet been formed.

That the early concepts were of a direct and material character is shown by what has been ascertained of the roots of language and there does not appear to be much difficulty in expressing by other than vocal instrumentality all that could have been expressed by those roots. Even now, with our vastly increased belongings of external life, avocations, and habits, nearly all that is absolutely necessary for our physical needs can be expressed in pantomime. Far beyond the mere signs for eating, drinking, sleeping, and the like, any one will understand a skilful representation in signs of a tailor, shoemaker, blacksmith, weaver, sailor, farmer, or doctor. So of washing, dressing, shaving, walking, driving, writing, reading, churning, milking, shoot-

ing, fishing, rowing, sailing, sawing, planing, boring, and, in short, an endless list.

Whether or not sight preceded hearing in order of development, it is difficult, in conjecturing the first attempts of man or his hypothetical ancestor at the expression either of percepts or concepts, to connect vocal sounds with any large number of objects, but it is readily conceivable that the characteristics of their forms and movements should have been suggested to the eye—highly exercised before the tongue—after the arms and fingers had become free for the requisite simulation or portrayal. It may readily be supposed that a troglodyte man would desire to communicate the finding of a cave in the vicinity of a pure pool, circled with soft grass, and shaded by trees bearing edible fruit. No sound of nature is connected with any of those objects, but the position and size of the cave, its distance and direction, the water, its quality, and amount, the verdant circling carpet, and the kind and height of the trees could have been made known by pantomime in the days of the mammoth, if articulate speech had not then been established, as Indians or deaf-mutes now communicate similar information by the same agency.

#### CONCLUSIONS.

It may be conceded that after man had attained to all his present faculties, he did not choose between the adoption of voice and gesture, and never, with those faculties, was in a state where the one was used to the absolute exclusion of the other. The epoch, however, to which our speculations relate, is that in which he had not reached the present symmetric development of his intellect and of his bodily organs, and the inquiry is, which mode of communication was earliest in adaptation to his simple wants and unformed intelligence. With the voice he could imitate distinctively but the few sounds of nature, while with gesture he could exhibit actions, motions, positions, forms, dimensions, directions and distances, with their derivatives and analogues. It would seem from this unequal division of capacity that oral speech remained rudimentary long after gesture had become an efficient instrument of thought and expression. With due allowance for all purely imitative sounds and for the spontaneous

action of the vocal organs under excitement, it appears that the connection between ideas and words is only to be explained by a compact between the speaker and hearer which supposes the existence of a prior mode of communication. This was probably by gesture, which, in the happy phrase of Sayce, "like the rope-bridges of the Himalayas or the Andes, formed the first rude means of communication between man and man." At least we may gladly accept it as a clew leading us out of the labyrinth of philologic confusion, and as regulating the immemorial search for man's pristine speech.

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