A Manifesto for Visible Language

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Mounting research evidence from the sciences, the humanities, and the visual arts prompts this call for a reassessment of some of the basic operating principles of language study. Linguistic research has not adequately clarified the relationship among three components: our inner organization of language (comlang) and its expression as visible language and as audible language. The visible and the audible language systems are discrete; one system cannot be interpreted in terms of the other, and it is not the fit between systems which is of first importance but how each operates independently. Language is of a piece with total human development. Research is reported which indicates that a closer affinity exists between man's internal information processing network and the *visible* language system—both for the way we handle language today and for the way in which our behavioral patterns were established during the origin and early development of language. An appeal is issued for additional research and theory to study the critical issues.

There is a doctrine within linguistics—and, indeed, in the consideration of language in any discipline—which holds that the relationship between speech and language is of a more fundamental nature than that between writing and language; that speech must be viewed as the basic medium for the expression of human language. I argue that the central premises of this doctrine conflict with recent evidence both within language study and in areas which impinge on language study. To put it more positively: I am suggesting that writing—not speech—has been the mainstream of the historic development of language and remains the key to understanding man's use of language for personal expression.

There are, of course, weak as well as strong interpretations of the primacy of speech position, and it is called into question by students of language from time to time. J. W. Firth, for example, has written: "It will be agreed that scientific priority cannot be given to spoken language as against written language, and I believe Bertrand Russell has somewhere said that we cannot even be sure in the dawn of humanity about

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the precedence of written marks and spoken signs."[1] But the fact remains that the primacy of speech position is not seriously challenged within contemporary linguistics, and its basic tenets continue to permeate most language-related research both within and without the linguistic discipline.

I am also aware that others before me have made claims for the critical importance of the visual expression of language. Among French writers especially there has been a strong continuing interest in the relationship between the process of writing and the processes of meaning. Jacques Derrida in particular has cogently argued the theoretical basis for a general science of writing (Grammatology).[2] His exposition—and refutation—of the primacy of speech position and his concept of writing as central not only to our understanding of language but also to the development of human thought have anticipated many of the ideas outlined here.

In the third century Chinese calligraphers discovered the value of putting a stiff center beneath a soft covering in making their brushes. What appears to be missing in our attempts to delineate the relationship among language and speech and writing is the stiff center of research confirmation—a commitment to hypotheses *and* verification as a cooperative scientific effort.

There are various reasons for this. There is, of course, much that we do not know. When we get down deep enough we are faced with two black boxes: the origin of language in history and the organization of language in our neurophysiological system. (It may well be that what we end up with is one black box approached from different directions.) But we are consoled with the belief that it is just a matter of years before the inner recesses of time and mind will be revealed to us.

More to the point, much that we do know has not been incorporated into the concept of language research. The visual system of language is considered peripheral and of secondary importance—a surrogate of speech. Too many critical issues are taken for granted or overly simplified—e.g., that what you are reading now is speech written down; that grammar has its basis in the oral/aural system; that early man spoke a proto-language before he wrote one. As a result, evidence on these issues accumulates without being accommodated into an evolving concept of the entire process, and we are left with a distorted image of language. There is a compromise of research; the critical experiments are not performed. The state of mind is not properly challenged.

An adequate challenge of present assumptions can hardly be mounted in these few pages. All I can possibly hope to instill is what Charles S. Peirce has referred to as "the irritation of doubt." Given the entrenchment of the primacy of speech position, this is in itself a formidable undertaking and can only be approached by getting down to the basic issues on how language works and to the organizing principles of its over-all design.

I believe the evidence is available, but we will have to look outside linguistics—to language-related research in the traditional disciplines of the sciences, the humanities, and the arts. I take it to be the task of an editor of an interdisciplinary journal such as *Visible Language* to gather this evidence. This manifesto is the distillation of the makings for a larger work that will more adequately treat the diverse and complex questions involved. Visible language has the advantage of being demonstrable in research literature, and many of these arguments would perhaps be better illustrated than stated. My emphasis on the words and ideas of others is for two reasons: they have already sharpened their own points, and they demonstrate again that the basic concerns of language research are too pervasive in humanistic research to be left to linguistics.

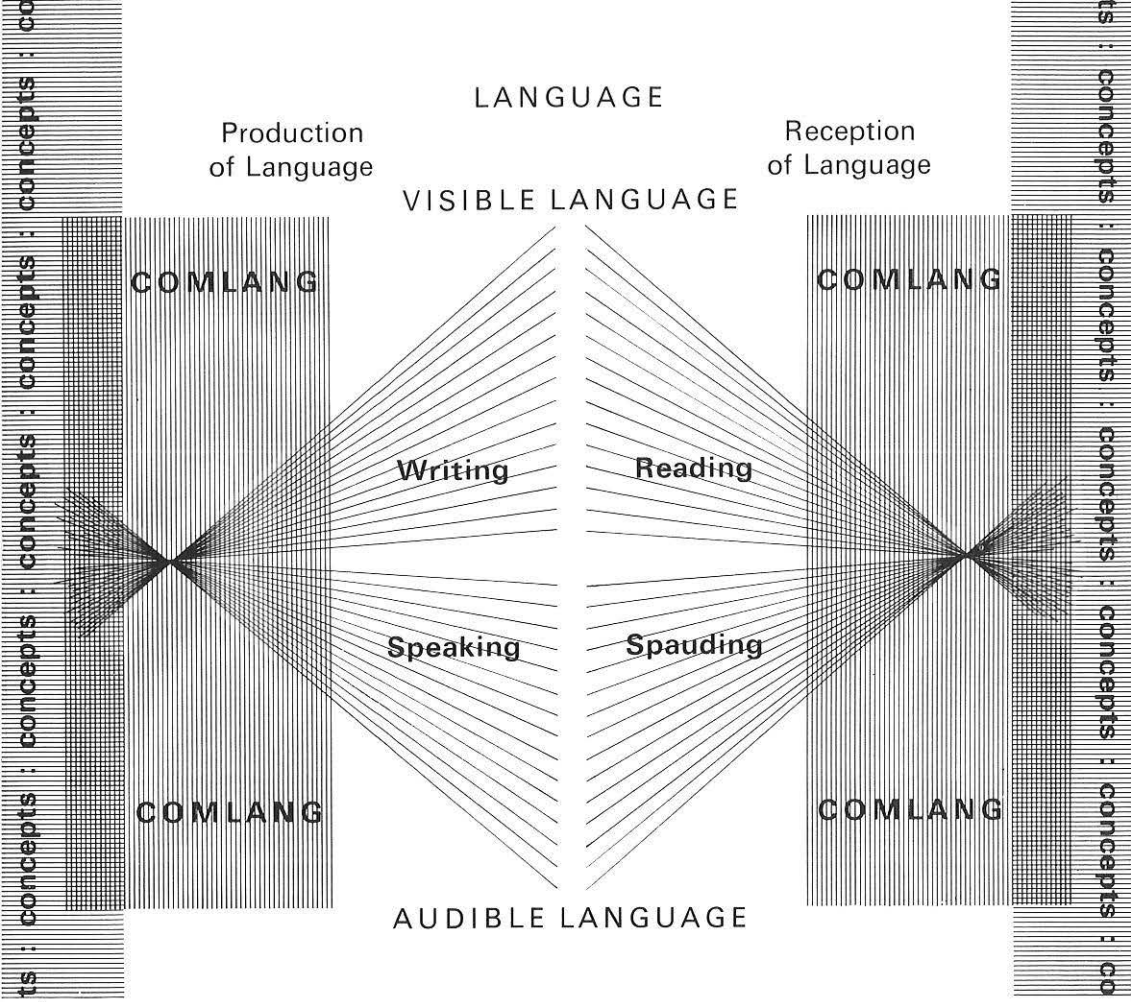
Some of the new relationships being proposed here are displayed in the accompanying chart. As a continual reminder, I have found it useful to incorporate several new terms. A few additional comments may be helpful.

"Verbal" should be interpreted as dealing with words, with no secondary special connection to audible language implied.

"System" of language is used to stress the basic neurophysical separateness of the two production/reception language processes. Basic to this manifesto is the uniqueness of the two language systems and their essentially parallel performance characteristics.

"Visible" and "audible" are used to differentiate these language systems because the interaction point between the production and reception of each is the visible or audible word. And we must think in terms of a unified system for each—from organization in production comlang to reorganization in reception comlang.

"Spauding" refers specifically to the reception of audible language, in order to satisfy the need for a more specific term than "listening"; it has a derivational link to sound and an alliterative link to speech—cf. reading and writing.



Language. The means developed by man to communicate meaning through verbal expression.

Comlang. The controlling processes involved in organizing the production and reception of verbal expression of meaning, including that part of language common to the language systems.

Visible Language. The system developed to utilize the visual/tactile neurophysical processes for the production and reception of language. Also the manifestation of language in visible form.

Audible Language. The system developed to utilize the vocal/auditory neurophysical processes for the production and reception of language. Also the manifestation of language in audible form.

I. Language and Meaning.

My primary concern is not with the language/concept interaction, but several points have relevance to the development of my thesis.

Language is only one of the processes developed by man to communicate meaning. We can assume that since his earliest beginnings man has used every means at his disposal to express himself. We have to understand the natural development of this complementary communication network both in our evolution and in our individual development. Each of these communication tools has its own strengths and its own weaknesses—its special function. We work out our strategies by recognizing our own capabilities in handling each of them. Language may reign supreme in many vital communication functions, but as Balzac noted, we are so constituted that we can withstand the most logical verbal argument but be swayed by a glance.

Each of our communication processes utilizes a complex mixture of mental, physical, and emotional factors. We can also assume that since our earliest beginnings we have used every resource within us to perfect our communication tools. One of the critical resources is creativity, not only that of the individual in his own social context, but also the sparks of genius that created language and moulded it into what Edward Stankiewicz has called "our most pervasive, versatile, and organizing instrument of communication."

Language is form, not content. Meaning is the thread that holds all of our communication effort together. The exact relation of language to meaning is an elusive, theoretical area. Somehow it seems that while meaning is *in* the language process it is not *of* the process. Meaning is not in the word—either written or spoken—meaning is a matter of convention, as Lev S. Vygotsky and others have pointed out. The direct relation between the arbitrary sounds of speech and meaning has not been substantiated. I will, however, consider possible implications of the early link between representation and visible language. While the meaning content has to be central, we are here concerned with the relative efficiency of our communication forms. In language study we are dealing with the window, not the out-of-doors.

Thinking is basically a non-verbal activity. It has been difficult for language theorists not to believe otherwise—including, for example, John B. Watson's assertion that "so-called thinking" is nothing more than minute, sub-vocal contractions of the muscles involved in the production of speech; the Whorfian theory that we think in a language and that

language shapes what we think and perceive; and the Chomskyian theory that there are separate mental faculties responsible for language. The visual artist would certainly question the priority of verbal over non-verbal access to our thinking processes; not being at home in the verbal arena, the argument of his work far outweighs those who attempt to verbalize for him. And this is no chicken/egg problem. That early man required a mind to develop language seems a self-evident truth. Albert Einstein has reported for modern man: "The words or the language, as they are written or spoken, do not seem to play any role in my mechanism of thought. The physical entities which seem to serve as elements in thought are signs and more or less clear images which can be 'voluntarily' reproduced and combined. . . . The elements are, in my case, of visual and some muscular type. Conventional words or other signs have to be sought for laboriously only in a secondary stage. . . ."[3]

Language can only approximate meaning. There is no unequivocal communication by language, or by any other of our meaning-transfer processes. "Whatever we know about reality has been mediated," Ulric Neisser writes, "not only by the organs of sense but by complex systems which interpret and reinterpret sensory information. The activity of the cognitive systems result in—and is integrated with—the activity of muscles and glands that we call 'behavior.' It is also partially—very partially—reflected in those private experiences of seeing, hearing, imagining, and thinking to which verbal descriptions never do full justice."[4] We despair of language, beset by the frustrations of not being understood—you know—and—you know—not understanding. The whole thrust of man's development of language and our competence to handle language is to create the best possible communication tool. As we shall see, there are compelling arguments to suggest that of the two language systems visible language is preeminently the better approximation tool to communicate meaning.

In sum: language must be seen in proper perspective. It is time we reconsidered the linguistic ptolemaic system which supposes speech to be the fixed center of our meaning-transfer universe, about which writing and language and all the other communication processes revolve. The verbal can only be fully understood in relation to the non-verbal. The audible can only be fully understood in relation to the visible. We need to ask the hard questions: How special is language? How basic is speech to the origin and development of the language process and our competence to handle it?

II. The Language Process

At both ends of this communication between us are concepts unformulated in language—the things I want to express right now and things you will be able to grasp (right now!) as a result of this verbal exchange. I first have to get my ideas formulated into the English language and then expressed into the appropriate language system. You have to be able to process this visible language expression, reformulate it into English and reconstruct the ideas—which can, at best, only be an approximation of what I have in mind. It is the layer upon layer of approximation that makes it all but impossible to overstate the complexity of language. We like to believe that somehow, somewhere within these complexities lies a simple, logical design.

For my purposes here I must keep the definition of "comlang" necessarily vague. Leonard Bloomfield referred to "the inner goings on"; perhaps we should leave it at that. In using language we seem to tap some controlling system which helps organize our thinking—what we want to express—as well as how we verbalize it. Although the language process is infinitely complex, it is rule governed. Comlang must include the rules of grammar and our grasp of those rules.

What universals there are in language must also be here. Although Frank Palmer points out that languages differ most in their grammatical structure, we assume that deep down there are similarities, that many characteristics of language are shared. The conventions of language are, however, interlocked with our boundless human creativity. The final reports are still out on whether these shared characteristics relate to some innate aptitude to acquire the rules of language—a potential language—or whether they might be, as George Miller has suggested, only what is easily learned.

My concern is with the interrelationship of parts of the language process and how these relationships developed. Rather than seeking to reinforce assumed connections between elements, I want to stress their autonomy.

Perhaps the clearest evidence to support a distinction between comlang and the language systems has developed in brain damage research. Herbert Pilch has summarized this: "Linguistically, the distinction between aphasis and dysarthria parallels the familiar dichotomies between langue and parole, form and substance, the -emic and the -etic levels. It provides, in a sense, empirical confirmation for these theoretical dichotomies."[5]

There are two points to emphasize here. First, comlang—our basic organization of language—handles language on an abstract level independent of its expression in either of the language systems. Second, each of the language systems approach this basic control directly—through clear channels.

Although we can hypothesize an independent comlang, there obviously has to be continuous interaction among the control center and the two performance systems. Edmund Leach points out: "The relation between the pattern of the shapes of the typewritten letters on this paper in front of me, and the shapes of the sound waves which I am imposing on my breath [as I make this lecture] is extremely complicated, but it is certainly a discoverable systematic relationship, otherwise it would be quite impossible for the sound and the written line to be recognized as having the same meaning."[6]

I am assuming that this complicated but discoverable relationship is part of the organizing of language in the comlang control center. The point here is that we may be better able to sort out this relationship once we recognize that we have two distinct threads to disentangle, and that we need to know a good deal more about how each of these operates independently.

Separation of the language systems and differentiation of their role in the language process will be the main concern of the balance of this paper. I will touch on two dimensions of their relationship: the synchronic, basically through the controlling factor of distinct neurophysical systems and different roles in society; and the diachronic, from language origin to the implications of new electronic devices. There are two points in the establishment of the separation of visible language and audible language that should be kept in mind throughout:

First: connections between the language systems—between reading and speaking or between speaking and writing, for example—are of secondary importance to the connection *within* each language system—between writing and reading and between speaking and spauding, the problems of literacy and oracy. While we should not discount the advantages that a closer fit between language systems has produced, these advantages are concerned almost entirely with language acquisition and language analysis—not with the efficiency of our accomplished performance in either system. The difference between accomplished performance in visible language—either writing or reading—and perform-

ance during literacy acquisition or arrested performance for experimental research is the difference between an airplane in flight and an airplane taxiing on the ground. There may be wheels to help the airplane get into the air, but it is the flight characteristics which should concern us. And, as any pilot will tell you, an important part of flight procedure is getting the wheels retracted as quickly as possible.

Second: we can neither adequately explain nor fully understand one language system in terms of the other. We must be careful to differentiate between research on the basic properties of language and research on the basic properties of either of the two language systems. For various reasons, research on the basic organization of language is more typically carried out in the visible language system; communication about basic language research is almost exclusively carried out through visible language channels. At the same time, an increasing amount of phonological research is being conducted to find out how language works in the audible language system. However, linguists often fail to differentiate between what is being discovered about audible language and what is directly applicable (1) to our understanding of comlang and basic language processing, and (2) to our understanding of how language works in the visible language system. Conversely, all that we know about language history is contained in visible language records. While these records contribute enormously to a better understanding of visible language and how our basic language organization evolved, our interpretation of them as audible language research is much less secure.

I have elsewhere referred to visible language research as an academic orphan. We have only ourselves to blame. A good deal of the problem is our acceptance of the control the primacy of speech position has managed to achieve in language study. Consider the effort spent in reading research alone on attempts to rationalize the forced fit between visible and audible language performance. Although we march to the same drummer, we deal with different dimensions, different equipment, different functions. And it is the differences which are critical to our understanding of the language process.

III. Our Neurophysiological Processing of Language

The basic workings of the human brain are still an enigma. The understanding of the language processes presents perhaps the biggest current challenge to neurophysiological research. The specific correlates of language and of the language systems are unknown, and language is tied up in debates which still rage about such basic questions as whether our higher intellectual powers are the function of the brain as a whole or of specific parts of the brain. My concerns are more modest: Can we identify any evidence in what is being discovered about language in the neurophysiological system to warrant closer examination of the role played by visible language?

Nobel Laureate Gunther Stent has pointed out that visual perception appears to be "a direct analogue to language." More specifically, "our visual perception of the outer world is filtered through a stage in which data are processed in terms of straight parallel lines, thanks to the way in which the input channels coming from the primary light-receptors of the retina are hooked up to the brain. This fact cannot fail to have profound psychological consequences; evidently a geometry based on straight parallel lines, and hence by extension on plane surfaces, is most immediately compatible with our mental equipment. It need not have been this way, since (at least from the neurophysiological point of view) the retinal ganglion cells could just as well have been connected to the higher cells in the visual cortex in a way that their concentric on-center and off-center receptive fields form arcs rather than straight lines. If evolution had given rise to that other circuitry, curved rather than plane surfaces would have been our primary spatial concept."[7]

Stent did not make the connection to the language system he was using. Consider the pages of rows of essentially straight parallel lines on a plane surface your sensory equipment is now processing. We have only to look at the development of writing systems—contemporary or historic—to see the emphasis put on straight parallel lines. And to repeat Stent, it need not have been this way.

That visual perception is a direct analogy to language lends support to the cognitive psychologists' contention that the linguistic and the perceptual channels share some higher cognitive level—a relation between language behavior and non-language perceptual behavior. Charles Osgood has suggested that if we are ever going to write anything productive about how people use language, "we must take into account two things: the prelinguistic development of both meanings and natural

cognitive structures, and the continuous interaction between perceiving and sentencing in ordinary language use."[8]

Cognitive psychology—and language research—is primarily interested in the inner, order-forming capacities of the human mind. It seems generally agreed that pattern recognition may be the key to understanding the brain's operation. As Rudolf Arnheim and others remind us, we owe a debt to gestalt psychology for emphasizing the importance of perception of relations rather than absolute features. Jagjit Singh has pointed out that "in most natural languages ideas emerge not out of language symbols or words per se but out of complex *patterns* formed by them."[9] This is essentially why, after initial enthusiasm over computer analysis, automatic translation of language has bogged down. A computer is still incapable of grasping the entire relevant concept of a language passage.

Audible language involves a temporal pattern or sequence of sounds. For example, certain types of discourse are enhanced—varying in importance in different languages—by a rhythmic temporal pattern. The audible language system is ideally equipped to handle time. Within a continuous sound, for example, the ear can detect a break only 2 to 4 milleseconds long. But the audible language system is not well equipped to handle space. We look to see where a sound is coming from. Roman Jakobson, among others, has pointed out that acoustic symbols deal preponderantly with time in contradistinction to visual symbols which deal mainly with space.

Actually, visible language involves a spatial-temporal pattern; visual perception operates dynamically as both a space- and time-governed system. Spatial perception is dependent on the rapid eye movements that constantly take place in normal vision—a sequential pattern of images—which provide continual perceptual feedback. The eye is the only sense organ that can be called part of the brain; as J. J. Gibson has pointed out, "the brain and the retina are in spatial and anatomical correspondence with each other."[10]

The processing of language, then, involves both temporal and spatial pattern recognition. A. R. Luria provides evidence to indicate that spatial organization may have the more direct tie to our basic organization of language. In an interview on his research in neuropsychology, Luria reports: "As a result of our work with patients with localized lesions, we know the components of such complex psychological functions as reading, writing, problem-solving, and understanding of grammatical

constructions. . . . Neuropsychological analysis has shown that disturbances of the lower parietal lobe (the cortical basis of spatial analysis and synthesis) lead to a loss of spatial orientation and the ability to count and to comprehend complex grammatical constructions. This means that these three different behaviors are all based on a single factor—simultaneous spatial analysis."[11]

Consider also a student learning to "diagram" a sentence, the linguists' display of complex grammatical constructions, and the terminology involved—left and right branching, etc. The point: grammar is spatial; visible language is spatial; audible language is temporal.

Recent second thoughts about the implications for language from split-brain research also throw light on the role of spatial analysis and language. Early split-brain research suggested significant differences in right and left hemisphere function: the left or "dominant" hemisphere being the seat of linguistic, sequential processes (among others) and the right hemisphere being involved in non-verbal, spatial concepts. This strict division now appears to be an over-simplification.

In general, the left hemisphere does appear to be dominant for speech expression, and the right hemisphere does appear to be dominant for spatial relations, for simultaneous patterning, and for some fundamental visual processes. The right hemisphere is by no means unconcerned with language, however. Richard M. Restak reports that "recent experimental data gathered by Eran Zaidel . . . has now convincingly demonstrated elaborate and complicated language performance by the adult right hemisphere. . . . The adult right hemisphere can read and follow instructions despite the inability of subjects to repeat them back, normally a left hemisphere function. . . . The discovery of language capacity in the adult right hemisphere calls for new consideration about hemisphere specialization."[12] Consider Restak's use of the words "elaborate and complicated language performance" (in visible language in the right spatial hemisphere), and Luria's use of "complex gramatical constructions" (in the spatial center).

Michael S. Gazzaniga had earlier pointed out that many right hemisphere functions can go on "independently and largely outside the awareness of the left hemisphere. It can read, learn, remember, emote, and act all by itself."[13]

Other general findings are emerging. A double-dominance model may more accurately reflect the nature of hemispheric organization. As a general rule following brain damage, visible language performance seems

to be more persistent. This is related to the fact that visible language neurophysical activity seems to be more widespread through the brain, whereas audible language activity is relatively isolated. Doreen Kimura suggests, "It may well be that the left hemisphere is particularly well adapted not for the symbolic function in itself but for the execution of some categories of motor activity that happen to lend themselves readily to communication."[14] And our basic concern *is* the symbolic function—the grammatical, spatial organization of the complex forms of language.

Perhaps as a side benefit from these recent discoveries future reporting of research will attempt to make a clearer distinction among language and the expression of language in the two language systems. One of the reasons for the delay in establishing language functions in the right hemisphere was undoubtedly the confusion caused by interchangeable use of "speech" and "language" in the literature as well as failure to recognize visible language as a distinct language system.

There is additional evidence from research on brain damage and dyslexia that visible language and audible language are handled differently by the sensory system. Norman Geschwind, for example, concluded that "the two processes have different neural mechanisms."[15] Susanne Langer had earlier pointed out, "The eye and the ear make their own abstractions and consequently dictate their own peculiar forms of conception."[16]

Man has developed language to organize and express his deepest thinking and his innermost feelings. Language is of a piece with total human development. Given the apparent closer affinity of visible language to our basic processing of language and given the general property of our neurophysiological system to generate efficiencies and economies, it becomes very difficult to imagine that the processing of visible language has to be filtered through or is governed by the audible language system. The facility, accuracy, precision, efficiency—name your language processing yardstick—of our speaking and spauding equipment are no match for their writing and reading counterparts. Both the hand (especially the thumb) and the eye have a disproportionately larger representation in the brain area. Vision is the dominant and most sophisticated of our senses; ninety percent of all information about the world comes through our eyes. If, indeed, language is the key to our human condition, would it have developed and would it be operated under the limitations of the audible language system and the constraints of its neurophysiological apparatus?

IV. The Performance of Language

Without question, the issues involved in our inner organization of language in comlang are central, but language is—first and foremost—a communications tool. To understand the performance characteristic of the two language systems is to help clarify the deeper issues of language research. And we should keep in mind that while cognitive psychologists stress the inner order-forming capacities of the mind, most agree that the capacities are developed only through involvement with the outer world.

We are confronted at once by a basic misunderstanding that persists in research and theory on language performance. I have indicated previously that the primacy of speech position implies that in one way or another, in one form or another, on one level or another the processing of our visible language performance requires the intercession of audible language organization. On the assumption that this is the case, the first priority for past visible language research and theory has been to establish the fit between what Eleanor Gibson and Harry Levin have referred to as "the written sequences and the spoken language." Noam Chomsky has suggested that "the most direct contribution that contemporary linguistics can make to the study of literacy is clarifying the relation of the conventional orthography to the structure of the spoken language."[17]

There are problems involved in maintaining this position. (1) The lack of fit between our performance of audible language and visible language is well documented in the literature. Frank Palmer, for example, has pointed out: "First it is important to realize that the spoken form and the written form of language are different. They are in some ways different languages and these differences can be brought out by careful linguistic investigation."[18] (2) The lack of fit between our performance of audible language and our inner organization of language is equally well documented. Chomsky and Morris Halle, for example, have pointed out: "The primary linguistic data [i.e., speech] are, in large measure, ill-formed, inappropriate, and *contrary to linguistic rule* [my italics]."[19] (3) Given the ineptness of most audible expression of language, on what basis can we then project the order-forming capacity and control of our inner organization of language? Our evidence of what full language "competence" might consist of it based on its manifestation in our visible expression of language. We may grasp from audible language performance the *need* for inner language resources, but we will never know what man is fully capable of from analyses of natural speech performance.

Consider then:

Audible language performance is a poor fit to visible language performance.
Audible language performance is a poor fit to inner language organization.
Visible language performance is an excellent fit to inner language organization.

But how can this be? If speech is primary, our innermost, basic language organization somehow must more closely represent the structure of audible language.

Voilá: Visible language performance must be an excellent fit not to inner language organization directly but to a theoretical inner structure of *audible* language—which, in essence, should be identical to the inner organization of language. Visible language, it then develops, is not language at all; it is a surrogate of speech. Visible language becomes "second-order" mapping to the hypothetical inner organization of audible language, not to the inner organization of language per se—to which it alone is the near-perfect fit!

The intricate rationalization of this primacy of speech position is not the concern of this paper. In its place I am suggesting reconsideration of the basic issues involved. In terms of the processing of language and in terms of the origin and early development of language, our accomplished performance in every established writing system—phonetic or non-phonetic—maps directly to meaning. Further, our inner organization of language can more appropriately be called the structure of *visible* language. The critical point here is the primacy of the visible language system at the very heart of language organization. Fred Householder asks, "Is it more economical to specify phonology first and derive orthography from it, or the other way round?" After eight pages of discussion, he concludes: "The chain of steps which leads from the stored form to the printed shape must come *before* the rules which eliminate the multiplicity of apparent phonological shapes, which must, in their turn, be earlier than the majority of phonological rules. Hence, even if you reject the lexical storing of pure orthography only, and store instead some precursor notation which will yield both orthography and phonology, the written shape must be generationally earlier, prior to the phonological shape. . . . So from the point of view . . . of economy and plausibility of rule construction, we must allow that writing is prior."[20]

I have stated that as a topic for language research and theory, the fit between visible language and audible language is of secondary importance to the understanding and perfecting of man's literacy and oracy. Without doubt, visible language and audible language have a substantial effect on one another, and it is important to understand the relationship. But we must keep in mind that for the accomplished performer in visible language, the phonic code is incidental. Phonetization of the alphabet and other writing systems is a province of orthoepy.

No problem in literacy research is more in need of critical attention than our lack of understanding about the accomplished performance of the literate reader and the literate writer. An important part of this is putting language acquisition into proper perspective. While no literature even approaches the sheer volume of literacy acquisition research, we still cannot seem to sort out methods and goals. The phonic training wheels are convenient and useful, but in a quantum jump to literacy the child short circuits the improvised audible language by-pass and with it his dependence on the phonic code. The surprising thing about leaning to read for the normal child is not how difficult but how easy and natural it is. There are enormous problems yet to be solved in reading research—e.g., in remedial reading and in understanding the reading process—but teaching the normal child to learn to read is not one of them.

Literacy acquisition is the child's introduction to an understanding of what constitutes the rules of language organization. There is no question that in his pre-school years he learns to converse fairly well and, it appears, in creative ways, but reading research is discovering that most children enter school in a state of cognitive confusion regarding the components of language. There is evidence, for example, that they do not understand what constitutes a spoken word.[21] And we have not properly challenged the primacy of speech position that our basic inner organization and processing of language are established during these pre-school, pre-literate years. Consider the contention that while a child has to be taught to read and write, he acquires language spontaneously through speech. M. M. Lewis has suggested that the richness of a child's early linguistic experience is greatly underestimated. "A child with normal hearing, born into a society of speakers, is surrounded by language from the moment of his birth. In his first three years, say his first one thousand days, he must hear some millions of words."[22] And Katrina de Hirsch points out that during this period he has perhaps the most dedicated teacher he will ever know: "The mother's on-going vocal and verbal

exchange with her baby . . . provides the matrix from which spring early communicative attitudes as well as the enjoyment of verbal give-and-take, which is essential for language acquisition and later learning. The mother caresses her baby with her voice; she tailors her own utterances to his specific developmental needs; she endlessly repeats sounds, words, and phrases, thus providing him with the data that allow him to detect and to organize the recurring intonational and phonemic signals into more stable categories. Wyatt describes this interaction as a mutual feedback based on unconscious identification. Piaget calls it 'contagion verbale.'"[23]

With an appropriate tool and a surface for marking, a normal child will begin spontaneous scribbling at about 18 months of age, somewhat later than spontaneous babbling; given a demonstration, he will produce scribbles even earlier.[24] We all know cases of children learning to read by themselves before entering school, although I am not aware of a research study on this. As recently reported in this journal, Danny D. and Miho T. Steinberg with dedicated parental attention beginning at six months of age taught their son "significant reading skills" before he could speak.[25]

Ever since Fernand de Saussure pushed aside his stacks of dusty volumes and abandoned his library carrel for the fresh air of contemporary speech, linguistics has been enamoured of "the living language." Obviously, the human social need for and dependence on the spontaneous flow of conversation is crucial to our understanding both of the origin and development of audible language and of its role in our network of communication processes. Important as talk is to us, however, I believe we need to take another look at its being designated the living source of human language.

Gilbert Ryle has pointed out that in the greater part of our conversation "we say the first things that come to our lips without deliberating what to say, or how to say it; we are confronted by no challenge to vindicate our statements, to elucidate the connections between our utterances, or to make plain the purpose of our questions, or the real point of our coaxings. Our talk is artless, spontaneous, and unweighted. It is not work and it is not meant to edify, to be remembered, or to be recorded."[26] We are interested in differences. R. Quirk has reported that "The Survey of English Usage considers that for grammatical research it is essential to have adequate samples of unprepared speech and free conversation and also collect written material in manuscript form as well as in print. There

is no reason to doubt that our organization of sentences is very different as between speaking and even the most casual letter, irrespective of whatever differences there may be or may not be in our use of vocabulary. We know that a perhaps even greater change comes over our sentence structure when we are preparing a more formal piece of writing—even some announcement for the bulletin board."[27] Why the basic difference? For two major reasons, I think: our audible language performance is caught in a temporal crunch and in an organizational crunch.

The Temporal Crunch

Audible language's original and abiding advantage is immediacy. But language is a complex mentally demanding process, and to organize it properly requires time and concentration. Eric Lenneberg has pointed out that our halting performance of natural speech is not so much the limitation of our articulation as our inability to organize abstract language fast enough. We speak off the top of our Broca's Area; when we are forced to be precise—to find the exact word, to use correct grammar and syntax—we are frustrated. And our listening performance is equally frustrating because we are not in charge of the situation. Since our goal is to approximate meaning, as best we can, we are forced to shift our communication strategy. We call on our non-verbal resources—vocal expression and especially gesture. And when the going gets tough in listening, we get effective support through labiolexia (which may be our only completely speech-based visible language!). There is a danger of confusing the complex total social exchange involved with the speech act for actual *language* performance. What is important for research is the distillation of pure language structure out of the larger field of semiotics —making a clearer distinction between the verbal and non-verbal content of "the living language."

The conversational nature of audible language has, of course, been the concern of a considerable research literature. Audible language is essentially a dialogue—a continuing give-and-take interaction of relatively small language units; in the average conversation a speaker is interrupted after every two or three sentences. The strong emphasis on the processing of speech in our short-term memory seems geared to our remembering just long enough to make a reply. Sentencing is also involved here and appears to be the activity of separate short-term memory mechanisms for the audible language and visible language systems.

While the dialogue pattern of exchange provides the obvious advantage

of communication rapport—including immediate feedback—it carries with it another element in the time vise on audible language performance. As you must realize from your own work, the use of language in any way approaching its true potential requires the time to settle into an idea, time for concentration. We want only to be let alone. Paul Horgan has written about his work as a professional writer: "The working day starts . . . on awakening, with a sort of bated breath in the thought, if I may put it so. Preparation for the morning's task gets under way in a state of absentmindedness. Any contact with a serious distraction or obligation elsewhere may, at this daily moment, disturb a balance already delicate. A phone call is a minor catastrophe and a knock on the door a potential disaster."[28]

Marcel Proust has written on the nature of reading: "The essential difference between a book and [a conversation with] a friend is not their degree of greatness of wisdom, but the manner in which we communicate with them—reading, contrary to conversation, consisting for each of us in receiving the communication of another thought, while we remain alone, that is to say, while continuing to enjoy the intellectual power we have in solitude, which conversation dissipates immediately; while continuing to be inspired, to maintain the mind's full, fruitful work on itself. . . . Reading, in its original essence, in that fruitful miracle of a communication in the midst of solitude, is something more. . . ."[29]

The Organizational Crunch

"Verbal language" is a redundancy. Language has to do with a body of words and the methods of combining them. We are less sure about what constitutes a word and how words function in language. Vygotsky has written "By *unit* we mean the product of analysis which, unlike elements, retains all the basic properties of the whole and which cannot be further divided without losing them. . . . The true unit of biological analysis is the living cell, possessing the basic properties of the living organism. What is the unit of verbal thought that meets these requirements? We believe that it can be found in the internal aspect of the word, in *word meaning*."[30] Gibson and Levin have pointed out that "So far as meaning is concerned, Chomsky is called a 'lexicalist,' since the focus of semantics in his theory involves the choice of words that have meaning in the framework or context of the sentence's grammatical form. His theory of lexical choice, which applies equally to written or spoken language, led him to believe that English orthography is near optimal."[31] Word mean-

ing, of course, is central. Words are useful to us only for the meaning we attach to their arbitrary form. There are, however, some aspects of these language forms we have developed to hold meaning that are pertinent to my thesis.

Words are not a natural language unit for audible language. Division of the unified and continuous stream of speech into constituent elements by researchers has turned out to be extremely difficult. Luria reports that "all aspects of the speech process in normal utterances are connected and indivisible to such an extent that a division into their components and a statement of their underlying factors is not always possible."[32] Reporting on research on conversational speech in acoustically optimal circumstances, Eric Wanner concluded that "conversational speech is simply not clear enough to permit a listener to recognize one word at a time, using the sounds local to each word. . . . Speech is recognized in terms of units which are longer than the single word."[33]

Frank Palmer is a linguist asking the question, "Are there words in the spoken language? . . . We must not assume that whenever we have words in writing we must have words in speech. This is a clear example of one of the areas in which we must keep speech and writing distinct, even if it is very difficult to do so." He ends this discussion: "In conclusion, sadly, we have to say that the word is not a clearly definable linguistic unit. We shall, perhaps, have to recognize some kind of unit that corresponds closely to the written word and define it ultimately in terms of a combination of features. . . . Some theorists have decided to do without the word altogether."[34]

The word *is* a clearly definable linguistic unit—alive and well—in comlang and in the visible language system. David Abercrombie has pointed out: "*All* systems of writing known to us give their symbols to words: the differences between them lie in the way these symbols are constructed. They may be simple symbols, or they may be made up from a small number of subsidiary signs; but however they are made up, it must not be forgotten that they will be read as words, and probably written as words also. . . . The object of writing is to provide an unambiguous symbol for every word in the language concerned."[35]

The word is a visible language concept. The significant visual pattern is the word unit, whether we are dealing with early man's first development of unambiguous language symbols in the form of representational "word" units or whether we are today putting together Chinese characters out of 22 different brush strokes or English words out of 26 alphabetic

letters. The important point is that the unit around which language is organized is directly compatible with verbal processing in the visible language system.

Students of language have since Aristotle recognized the difference between the discrete nature of language and the continuous nature of speech. For this reason primarily linguists have been hard pressed to find a workable unit for audible language research. And it is probably the reason why we have no practical organization of language based on phonological rules. If we were to produce a dictionary of language units based on audible language performance, how would it be organized, or used?

Beginning in the early 1930s Leonard Bloomfield and the post-Bloomfieldian structuralists attempted to build their speech regularities, patterns, and rules on a theoretical unit of sound: the phoneme. But the phoneme has proved to be a very elusive working unit for speech analysis. In summarizing research on errors in spontaneous speech, Victoria Fromkin points out a rationale for the phoneme's existence: "Many errors involve the abstract, discrete elements of sound we call phonemes. Although we cannot find these elements either in the moving articulators or in the acoustic signal, the fact that we learn to read and write with alphabetic symbols shows that they exist."[36] The larger working unit for speech analysis is the utterance—which can be defined as any continuous stretch of speech from a single source. Adaptable to the way people actually speak, it can be made up of grammatically incomplete sentences, a single sentence, or a sequence of sentences. It follows, however, that no matter what form the linguists' characterization of audible language takes, it will ultimately have to be reconciled with word-unit processing in our inner organization of language.

George Steiner has commented on the difficulty of audible language analysis: "To plead the exceeding difficulty of the whole business is no evasion. It turns out that a complete formal analysis of even the most rudimentary acts of speech, poses almost intractable problems of method and definition."[37] It is no wonder (to recall an old joke) that linguists choose the visible language system in which to do most of their work—where the light is better.

Jerome Bruner has suggested that the mind employs two basic rules in perceiving and putting order into our information processing: minimization of surprise and maximization of attention. The reason why no com-

munication can match the printed page in efficiency of information transfer is because only typography provides the uniformity of language performance required to minimize surprise and maximize attention—in fact, to such an extent as to make the visible language process transparent.

Typography involves both the design of a matched set of letters and their organization on the page. In his attempt to imitate contemporary handwritten manuscripts, Gutenberg's most difficult task—and the secret of typography's success—was the fit of these interchangeable letter units. A serendipitous result was the quantum jump to silent reading. (Could the ancient and medieval practice of only reading aloud be a legacy of the Greeks' addition of vowels to the alphabet to facilitate pronunciation?) John Mountford has referred to "the change from the manuscript-age practice of teaching writing (with reading intrinsic) to the growth of the policy, induced by the advance of printing and its concomitant literacy, of teaching reading (with writing extrinsic)."[38]

The audible-language Gutenberg may be at work now at the Massachusetts Institute of Technology. A machine has been developed there that converts printed or typewritten text into computerized speech. The computer analyzes the signals according to programed rules for pronunciation and sends a command for coded speech units to a speech-producing device which transforms the coded signals into language sounds. The intriguing question is whether the new machine will provide the necessary uniformity of speech units for a parallel quantum jump in audible language processing—from the current emphasis on speaking (with spauding extrinsic) to an emphasis on spauding (with speaking intrinsic).

You may well ask: But what happens to the living language? During printing's incunabula period the Duke of Alba is reported to have forbid the placement of any printed book on his library shelves. Who can look at a medieval illuminated manuscript and not identify with the hue and cry that must have accompanied the mechanization of handwriting. Living language remains in much visible language expression—we are apt to forget this dimension in the flood of typography—and it will remain in audible language. But the attack on the inefficiency of speech production may be an idea whose time has come. Special requirements for the blind have sparked the invention of computerized speech; communication pressures will undoubtedly exploit it.

V. The Evolution and Early Development of Language

Last September I attended the week-long conference on Origin and Evolution of Language and Speech sponsored by The New York Academy of Sciences—53 speakers plus discussion. I missed no more than an hour or so and recall only one fleeting reference specifically to written language. You are not surprised; I was not surprised. Nowhere is the primacy of speech position more ingrained than in the theoretical link of speech and language in glottogenesis. Which is not to imply, however, that the conference was without valuable evidence to support this manifesto. A more accurate name for the New York meeting would have been Primate Communication and the Gestural Origin of Language—to borrow the title from Gordon Hewes's excellent article on this topic which must have sparked the conference.

While it is still a moot point, anthropologists seem generally agreed that articulate speech has been a fairly recent human acquisition. How recent depends on whom you read. Philip Lieberman has determined that reconstruction of the vocal apparatus of Neanderthal man (ca. 70,000 to 40,000 BC) indicates he lacked a pharynx, which plays the major role in determining phonetic quality of vowels and consonants of human speech.[39] It would thus be impossible to teach a Neanderthal to talk any human language. It also seemed to be the consensus that, contrary to most previous theory, sophisticated audible language was not required for early man to make tools and perform his day-to-day activities. And neuro-anthropologists had previously pointed out that all of the basic evolution of the brain took place before the emergence of speech.

In essence, the gestural theory of origin supplies the proto-language base from which audible language is said to have sprung. I find myself eager to agree with most of the gestural theory arguments. For example: Man's language is connected to his superior intelligence and depends on more than the presence of organs capable of producing sound. The ultimate origin of language must lie far back in time, in connection with environmental and social pressures and in relation to earlier primate communication. The capacity of higher animals to "read" signals emitted by other species is an important primate preadaptation for language. The handing down of tool traditions probably depended for a long time not on speech, but on visual observation. Cerebral lateralization preceded the development of speech and depended on "the joint selective produc-

tion of more precise tool and weapon manipulation, pressures for much greater terrain cognizance involving right-left consistency with respect to responses to visible landmarks, and the growth of a manual-gesture did not wither away but persists as a common accompaniment of speech, either as "a kinesic paralanguage for conveying nuances, emphasis, or even contradiction of the spoken message."[40]

While the arguments and logic of the gestural origin theory help clarify the primacy of speech position, I have trouble coming to similar conclusions. The gestural theory (perhaps better: the "gest-oral theory") goes a long way—but only part way. If we are going to revive the language origin issue after a hundred dormant years, we had better get *all* the folders out of the file.

It is also important to keep in mind that the origins of gesture and speech and writing are all intermediate checkpoints; our primary target is understanding the origin of language. The late arrival of sophisticated speech on the human communication scene is, in itself, incidental to the larger issues involved. The basic assumption in emergence-of-man research is that most contemporary behavior is based on patterns established during the last few million years of evolution. We are interested, then, in determining the most logical natural connection of language origin with the total development of man. More specifically, if the ties between the visible language system and our basic inner language capacities are as direct as they appear to be, we need to ask how these patterns were established.

A second major theme of the New York meeting was the possible continuity of cognitive processes between subhuman and human primates, primarily as demonstrated by the chimpanzees which have been taught language. There seems to be little doubt that chimps have learned—by using sign language or geometric visual symbols—to communicate with a visible "language." Lana (at the Yerkes Primate Research Center in Atlanta) using a vocabulary of about 120 words is reported to have developed far beyond simple signs and is able to grasp abstract concepts and to compose novel, meaningful sentences. Lana initiates linguistic exchanges, composing both questions and statements not taught to her. But is she or is she not using language similar in some degree to our use of language?

Ann J. and David Premack have written, "Why try to teach human language to an ape? In our own case the motive was to better define the

fundamental nature of language. . . . It is possible that certain features of human language that are considered to be uniquely human belong to the more general system, and that these features can be distinguished from those that are unique to the human information-processing regime. If, for example, an ape can be taught the rudiments of human language, it should clarify the dividing line between the general system and the human one."[41]

Several points are pertinent here: (1) The theoretical gulf separating the cognitive processes of man and animal seems to be filling in. Linguistic potential or capacity of primates is one of the approaches to understanding the similarity and differences in these processes. (2) Lana (from Atlanta) uses a computer keyboard (with geometric symbols) and a video screen; Sarah (Premack) uses variously shaped and colored pieces of plastic; Washoe (Gardner) uses American Sign Language.[42] The common factor in all of the sussessful attempts to teach at least the rudiments of language to apes has been in the visual/manual mode. (It would be interesting to see how Lana and Sarah react to symbols constructed out of straight parallel lines on a surface.) (3) In a book review Peter C. Reynolds writes, "Why [does] communication develop in one channel and not another. . . . Tembrock points out that in mammals, acoustic and visual communication succeeded the more primitive chemical channel; but in some taxa vocalization has undergone a secondary regression, whereas in man it became the vehicle for language—a curious development for a visual animal."[43] The ideas get curiouser and curiouser. The initial attempts (in the 1930s and 1940s) to teach chimps to communicate with language started out with the idea that if language learning were possible at all one could, of course, elicit and control vocalization in apes. The efforts failed. Recent evidence reported by Richard Restak suggests why: "Ronald E. Myers . . . has studied the comparative neurology of vocalization and speech. His research indicated that human speech developed spontaneously at a certain level of hemisphere integration and is totally unrelated to the crude vocalization of the other primates."[44] The audible language system was apparently an adaptation—a grafting on to basic processing already established.

In order to come to terms with his environment as well as with his contemporaries, early man must surely have used his entire primitive semiotic repertory—gestures, cries, expressions, marks. Out of this mixed bag, which communication effort was he better equipped and more strongly

motivated to capitalize on as part of his developing human condition? Robert Baidewood lists four elements involved in the earliest differentiation of man: "(1) The increasing usefulness (specialization) of the thumb and hand. . . . (2) The development of tools. . . . (3) The increasing size and development of the brain. (4) The development of simple language. Nobody knows which of these is most important, or which came first. Most probably the growth of all four was very much blended together. . . . Unless your hand is more flexible than a paw, and your thumb will work against (or oppose) your fingers, you can't hold a tool very well. But you wouldn't get the idea of using a tool unless you had enough brain to help you see cause and effect. The increase in brain size and the internal reorganization were probably associated with basic behavioral changes. These changes probably resulted in language and tool production. And it is rather hard to see how your hand and brain would develop unless they had something to practice on—like tools. In W. M. Korgman's words, "*the hand must become the obedient servant of the eye and the brain* [my italics]."[45]

No idea has had more support in anthropology than the critical importance to man's emergence of tool making and tool use. George Miller and Jerome Bruner, among others, have stressed the connection between the use of tools and the development of language; the development of manual skills includes strategies later used for thought and language.

That tool use preceded language use there is little doubt. The earliest tools found have been dated to about 3 million years ago. Man's first thoughtful mark making, therefore, can be similarly dated, since the first thing one does with any tool is make a mark, if it is only the impression left by an unworked, hand-held rock. Tools got more sophisticated; marks got more sophisticated—and, I suggest, more meaningful. How does one tell one flake tool from another except by its distinctive surface pattern of marks? Archaeologists report that tools were made to a pattern at least a million years ago, about the time the control of fire appeared as a major technological addition—and with it the marking tool we still find almost impossible not to experiment with while sitting around a camp fire.

Early man was a visual animal, but he could depend on both his sight and his hearing for accurate, precise sensory information; although, as I have indicated, human vocal capabilities were severly restricted until much later in human development. The communication effort for which

man was best equipped was mark making. From among the bones just reported discovered in East Africa (dated to at least 3 million years ago), Donald Johanson has "pieced together a composite hand that he said approximated modern man's in size . . . and appeared capable of as much dexterity as today's human hand."[46] According to Alan Lomax, "There can be no doubt of a rapid evolutionary development in systems for handling symbols. In fact, the close parallel between the manipulative and the differentiative factor suggest that every major human advance has been made possible by an increase in manipulative finesse."[47]

At the New York meeting Alexander Marshack presented photographs of a fragment of an ox rib dug up in France and dated to the Early Mousterian Culture of about 300,000 years ago. On it someone had scratched over and over again pairs of straight parallel lines. Composition of individual zigzag elements involving several lines was continuous, made without lifting the tool from the surface.[48]

Is the system of markings on this Mousterian fragment a form of decoration? Perhaps. But keep in mind that until as late as the eighteenth century hieroglyphics were thought to be only Egyptian tomb decoration. Are the marks writing? Surely not in our generally accepted definition. Are they a form of visible language? It would be tempting to compare Marshack's discovery with, say, a crude line of eighth-century runes and extend the emergence of visible language back to Homo erectus! There is other evidence that supports the idea. Ralph Holloway has pointed out that a region of the brain associated with language ability and that is visible as a bulge on the brain of modern man is just barely discernible on casts made inside the "1470" Leakey skull (estimated between 2 and 3 million years old). This suggests that a region of the brain involved in language may have begun to develop that long ago.[49] But let us settle—for now—on the marked fragment being just that, only a piece of the puzzle.

If what we have here is evidence that our ancestors 300,000 years ago were interested in and capable of making a meaningful pattern of visible marks that appear to be at least visually related to later development of writing, then all of the pre-historic scratches and drawings and decorations we assemble since that period take on added significance. The bulk of Marshack's research has been concerned with analyzing recurring patterns of markings on fragments of bone, antler, and stone used throughout most of what is now Europe and beginning about 34,000

years ago during the last ice age.[50] It becomes easier in light of the earlier find to think of these schematic symbol systems of upper Paleolithic "Europe" as documenting the presence of the necessary cognitive, abstractional, and linguistic capacities required for an operational visible language system. The complete meaning and function of these systems to early man are undoubtedly forever beyond our comprehension. While it is dangerous to over-generalize from this mere inkling of what early man was capable of, it is equally dangerous to sell him short. As Sir Mortimer Wheeler put it, "The archaeologist may find the tub, but altogether miss Diogenes."[51]

Ashley Montague has pointed out that creative practical intelligence preceded rational intelligence. In searching for the origin of language we are interested not so much in early man's making signs as in his creation of symbols. The very essence of our being human lies in our ability to use symbols. More to the point is Julian Jayne's statement that in the history of animals, of early man, and in young children audible signals are used to express emotion and visible signals to express rational concepts. A later development is the transfer of intentional signals from visible to audible expression. Further, the earlier visible, intentional signals are more likely to have been responsible for the development of symbolization in early man.[52]

Symbolization involves first a process of abstraction; the starting point is something to abstract from. The advantage visible symbols have from the start is that their roots lie in representation. Most gestural signs for independent sign systems for the deaf are also originally based on the representation of objects or activities, and surely—as gestural theorists have shown—signing must have been an important communication medium for early man. But as skilled as signing practitioners can become, visible gestures are no match for visible marks in the range and adaptation of original representation—cf. the comparative development of mime and the visual graphic arts. Audible signs are almost totally arbitrary from the beginning. And gestural expression has problems similar to audible expression in the differentiation of units of meaning and in the purity of its language structure and performance. (I would, however, generally agree with William Stokoe, et al., that Sign is most likely a distinct expression of our inner organization of language, relating directly to experience and not mediated by audible language.) Gesture is involved in tool making, tool use, and symbolization, but as a second-

ary, derived element. Which of the two—the gesture or the mark—is more likely to survive as the significant form?

The representational nature of the visible units provides the purchase for their development as infinitely more powerful abstract symbols and, eventually, the complex visible language system we are now sharing. We are, of course, interested in the symbolic function of a "word" unit, not in its sign function. Susanne Langer has written, "The power of understanding symbols, i.e., of regarding everything about a sense-datum as irrelevent except a certain *form* that it embodies, is the most characteristic mental trait of mankind. It issues in an unconscious, spontaneous process of *abstraction,* which goes on all the time in the human mind: a process of recognizing the concept of any configuration given to experience and forming a conception accordingly. That is the real sense of Aristotle's definition of man as 'the rational animal.' *Abstractive seeing* is the foundation of our rationality."[53]

The representational link gradually loses its importance as the visible pattern takes on symbolic meaning by assuming the semantic values of the object and the aura we build around it. In a quantum leap the visible mark becomes an arbitrary symbol, whose original meaning can only be traced etymologically. The development of any symbol is a history of abstraction. Our verbal symbols develop simultaneously as personal ideas and shared social concepts. Like a string of Greek worry beads, our words are polished a little each time we handle them.

Similarly, the actual visual configurations are gradually simplified. We may be aware, for example, that the letter A could be an upside-down abstraction of an ox head or that the Chinese character for man  is an abstraction from a human figure, but the derivation and modification of our visible language symbols are inconsequential to accomplished processing of that expression as language.

The concept of naming becomes important here. With the gradual development and refinement of man's vocal abilities, sounds were undoubtedly attached to objects, actions, and activities. They were also very likely attached to meaningful visible configurations—whether the painted representation of a bison hunt, the scratched representation of the bisons' likely migration route, or the repeated abstract symbol for a killed bison. Given man's early graphic sophistication and his probable late speech performance, it is difficult to imagine that the reverse was true; i.e., the attempt to attach objects to sounds. There is strong evidence that gestures, among other human activities, were represented in later writing

systems. However, Colin Cherry has pointed out, "It is the outward and visible symbols which persist so obstinately; it is their forms which remain whilst they take over new content and meanings in their new environments."[54]

George Miller has commented on the importance of visible language as object. "The written proposition is a tangible representation of an act of thought. It is a physical thing, an object, and it can be reacted to as any object can. Thus writing made it possible to react to one's own thoughts as if they were objects, so the act of thought became itself a subject for further thought. Thus extended abstraction became possible, and one of the brilliant abstractions recognized by the Greeks concerned the forms of valid arguments. And so, out of writing, was logic born."[55]

Miller's statement brings up another basic difference between visible language and audible language that requires brief consideration. Richard Gregory has considered a related point: "As symbols escaped the semblance of objects and became less like pictures, so they became more powerful. In the development of the determinatives, and the signs for logical operations, we see how the power of symbols and formal languages as tools developed, drawing men inexorably away from their biological origins. It was, surely, the artists who took the first crucial step: to see and to select and to make objects as representing something existing in a different place and time, or not existing at all. This used the eye in quite a new way. . . . By introducing the strange power of formal symbols, it made science possible."[56]

Visible language, by definition, is the basic communication for the literati; audible language is the basic communication for the illiterati. In civilizations and in cultures which developed into civilizations, the literati have been in control of language. Edward Sapir has referred to language as the most massively resistant to change of all social phenomena. Both systems contribute to language development, but it is visible language that provides the logical continuity—the unifying centripetal force—of man's continuing effort to organize and to communicate meaning. Audible language is a dog on a leash.

But control of language implies much more. Jacob Bronowski spoke of "the aristocracy of the intellect." Claude Lévi-Strauss has referred at various times to writing as a tool of the elite to control and exploit the masses. An Egyptian inscription in New York's Metropolitan Museum puts the idea more simply: "Be a scribe, for the scribe directs every work that is in this land." It seems inconceivable that the crucial break-

throughs in the evolution of language from its earliest beginnings could have been taken by other than the most creative minds of the day. And because of this, language has been more than a match for countless generations of the best minds the human race has produced—our literati.

Primarily because of the primacy of speech position among linguists the differences between literate and illiterate societies have been played down. The important consideration is not the complexity of the vernacular languages—which is still a moot point—but the thinking tool that literacy provides. In his book *Applied Communication in Developing Countries* Andres Fuglesang points out that the power of abstract thought varies according to the degree of literacy.[57] The illiterate villager is not open to alternatives; he can only deal with the "here and concrete"; he has trouble with counting, straightness, and planes. Illiterates have difficulty in building on their experiences of the past. Yet cumulative tradition is one of our most basic, unique human behaviors. Alfred Korzybski made it the basis for his time-binding theory: men and men alone pass on to each other what they have learned; each one starts where his predecessors ended. What are the critical differences between the language organization and the thinking of the literati and the illiterati? And what connection does this have to the illiterati being split off from the mainstream of language development—either as groups at some pre-historic time or as an individual in today's society?

The first recorded attempt to develop a writing system for an unwritten language appears to have been by the Sumerian literati for their illiterate Semitic conquerors. The Sumerian scribes adapted their existing visible language system to reproduce as best they could the language sounds used by Semitic invaders. It seems likely that the limited repertory of speech sounds, which had to be repeated and combined for differentiation, led the scribes to grasp the revolutionary concept of interchangeable units for constructing visible language symbols. The creative talent of the scribes gradually seized on the idea as a vastly simpler, more flexible system with which to work. In essence, the basic visible language processing unit—the meaningful symbol—was reconstituted as the word.

To deduce from this adaptation process, however, that the entire visible language system assumed the character of the audible language system is to ignore the basic relationship that has existed among language and the two language systems through history and pre-history. There is no indication during this transition period of any preoccupation with the

fit of visible language to audible language; the gap between the two was a long time in narrowing. It took another millenium before the Greeks added vowels—most likely to help pronounce borrowed words—for the alphabet to develop the form we more or less know it as today.

Letters and words do not represent speech sounds; sentences and written composition do not represent oral composition. They never have. Early writing systems were essentially visual, as they continue to be today. As reported by John Chadwick, Michael Ventris in the decipherment of Linear B "laid stress on the visual approach to the problem; he made himself so familiar with the visual aspect of the texts that large sections were imprinted on his mind simply as visual patterns, long before the decipherment gave them meaning. . . . Ventris was able to discern among the bewildering variety of the mysterious signs, patterns and regularities which betrayed the underlying structure."[58]

One of the Paul Bunyan stories reports a winter of such intense cold that everybody's speech froze up, and it wasn't until the first spring day that it all thawed out with a cacophonous roar. Is the decipherment of ancient texts just the thawing out of our ancestors' encapsulated speech? We can discover and recreate lost languages through the decipherment of visible language fragments, but we will never know what the contemporary audible language was like—or about. It is difficult to imagine that the quality of our ancestors' speech could have been much different —certainly no better—than our own speech is today. On what basis then can we continue to assume that the ancients were gifted with the superior audible language performance necessary to instill the complex rules and organization which govern our language processes today?

General Conclusions

First, it should be recognized that as an advocate for the critical importance of visible language, I am the traditionalist. The rise in influence of phonetics and phonology to the dominant position in linguistics is a recent phenomena in the history of language study. While the contributions this movement has made to our understanding of the audible language system are enormous and long overdue, they have been made at the expense of perspective on the language process as a whole. This manifesto is an appeal for language research to seek a middle ground. We must, for example, recognize that the visible and audible language systems are discrete; of first importance is understanding how each system operates independently, and how each helps determine—and is determined by—our inner organization and control of language.

Second, I suspect that general disenchantment with the control over language study which the primacy of speech position has exercised is more widespread than indications in the literature would lead us to believe. The problem is one of focus; there appears to be no established counter-position to marshal the scattered evidence and dissident opinions. Meanwhile, however, research accumulates in language-related areas based on hypothetical assumptions of the primacy of speech position. This manifesto suggests that a new concept of visible language should provide the rallying point for a concerted effort from all disciplines which impinge on language study to clarify the relationship among three basic components: language per se and its expression as visible language and as audible language.

Third, the research reported here barely scratches the surface of the issues involved; each area requires the deeper insight and the selective investigation which can be provided only by appropriate research specialists. But if, as the evidence seems to indicate, a closer affinity does exist between man's total human development and the visible language system, important modifications will have to be made in our thinking about the relationship and specific characteristics of the components of language, as well as our developing total concept of language in man. This manifesto is an appeal for your support. We need to sort out new priorities for language research—what are the basic issues, how do we put them to test? It is the stated purpose of this journal to provide a forum for research and theory on visible language issues. We invite your comments and your editorial contributions.

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