Refurbishing our Foundations

C. F. Hockett

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OUR FOUNDATIONS

ELEMENTARY LINGUISTICS FROM AN
ADVANCED POINT OF VIEW

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PREFACE

This essay is a sort of inverted Festschrift (a Schriftfest? a Tfirhcstsef? a ⌐ɘɀʇɔɥɬᴉɿɟ?) in honor of my most exacting instructors: my students. It is intended especially for my colleagues — many of them former students (*) — Frederick B. Agard, Edward L. Blansitt Jr, *Ann Bodine, Dwight L. Bolinger, *J. Marvin Brown, William M. Christie Jr, *James E. Copeland, *Ronald Cosper, *Philip W. Davis, *Robert J. DiPietro, *James W. Gair, Paul L. Garvin, Toby D. Griffen, Robert A. Hall Jr, Michael A. K. Halliday, Eric P. Hamp, Henry M. Hoenigswald, Dell Hymes, *Ashok Kelkar, Gerald B. Kelley, *James Kilbury, *D. Robert Ladd Jr, Adam Makkai, Valerie Becker Makkai, *William R. Merrifield, *Rocky V. Miranda, William B. Moulton, *David L. Olmsted, *Dennis E. Peacock, *Velma B. Pickett, Kenneth L. Pike, Ernst Pulgram, *Albert J. Schütz, Hugh M. Stimson, Lenora A. Timm, the late W. Freeman Twaddell, *Ralph Vanderslice, the late Carl F. Voegelin, Florence M. Voegelin, *Willard Walker, *Stephen Wallace, Linda R. Waugh, Roger W. Wescott, and *John U. Wolff, as a token of my appreciation for their recent joint enterprise in my behalf [*Essays in Honor of Charles F. Hockett* (Leiden: E. J. Brill, 1983)].

In October of 1984 an earlier version of this material was presented as a lecture series entitled "Refurbishing the Foundations of Linguistics," under the auspices of the Department of Linguistics and Semiotics of Rice University, Houston TX. Those in attendance at some or all of these lectures included Sydney M. Lamb (the chairman of the department), Lily Chen, James E. Copeland, Philip W. Davis, Lane Kauffmann, Douglas Mitchell, Stephen Tyler; Stephen Wallace; Katharina Barbe, Elizabeth Cummings-Culliton, Cynthia Edmiston, Don Hardy, Lillian Huang, Daniel Mailman, Alan Rister; and, on one happy occasion when he was able to fly down from Austin, Winfred P. Lehmann. Their questions and comments proved invaluable both in revealing errors and gaps of which I had been unaware and in suggesting ways to correct them. It goes almost, but not quite, without saying that remaining deficiencies are all my own.

In writing this essay I have *proceeded somewhat as though preparing a new* course for my old students, treating afresh, with the benefit of more experience and further pondering, many of the topics we discussed during their apprenticeships. In keeping with that, and reflecting the atmosphere we used to establish together in the classroom, throughout the essay the pronoun "you" — conveniently ambiguous as to *number* — means the reader(s), and "we" is the INCLUSIVE first-person plural. In the same spirit, through all stages of preparation the subtitle appeared as *Elementary Linguistics*

from an Advanced Point of View Out, not just an allusion to but also a takeoff on Felix Klein's famous *Elementarmathematik von höheren Standpunkte aus* (Leipzig: B. G. Teubner, 1908-9). But at the last moment I could not quite muster the audacity to put it into print that way, so *out* dropped out. In either form the subtitle is appropriate. We deal here with elementary issues, but I am not addressing novices. I speak to my fellow sophisticates, asking that for the nonce they join me in setting aside a measure of that sophistication, that together we may explore a new and different path.

So as not to interrupt the flow of the exposition, most critical apparatus, together with a fair amount of subsidiary commentary, is relegated to the notes. The phenomenal expansion of the ranks of professional linguists in recent years makes it ever more likely that different investigators will independently think some of the same thoughts, but also increasingly difficult to know when that has happened — both because the volume of literature is unmanageable and because the terminologies of different schools of linguistics verge on mutual unintelligibility. I am sure that many of the ideas I present as my own in this essay will sound to some readers like echoes. I have no desire to slight anyone, and will be delighted to acknowledge, with apologies for my ignorance or oversight, any omissions of credit called to my attention.

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0. INTRODUCTION

0.1. Attitude. No one in any culture known to us denies the importance of language. Partly because it is important, partly just because, like Mount Everest, it is there, we should like to know how it works. To that end, people from time immemorial have examined it or speculated about it, trying to come up with cogent commentary.

What one sees of language, as of anything, depends on the angle of view, and different explorers approach from different directions. Unfortunately, sometimes they become so enamored of their particular approach that they incline to scoff at any other, so that instead of everybody being the richer for the variety, everybody loses. That attitude has been called the "eclipsing stance." The early followers of Noam Chomsky adopted this stance, but they were by no means the first: some of us post-Bloomfieldians came close to it in the 1940s (though Leonard Bloomfield himself never did), and so, apparently, did the Junggrammatiker in the late 1870s. But it is a wrong position to take, even toward those who have themselves assumed it. It is obviously impossible to see all of anything from a single vantage point. So it is never inappropriate to seek new perspectives, and always unseemly to derogate those favored by others. Or, to use a different figure: the blind man touching the tail has reason to say an elephant is like a rope, but no right to claim an elephant is not also like a wall or a tree-trunk or a snake.

I don't mean we shouldn't be critical. I do mean we should try to be most wary just of those propositions that we ourselves hold, or have held, closest to our hearts — above all, those we come to realize we have been taking for granted. Scientific hypotheses are formulated not to be protected but to be attacked. The good hypothesis defends itself, needing no help from enthusiastic partisans.

0.2. Angle of Approach. Our title speaks of the "foundations" of linguistics. Where do we find them?

That question has received answers of two sharply different sorts. Some investigators ally natural language with logic and mathematics, and place the foundations of all three in an ideal world of pure logic. Others see language as a feature of everyday human conduct, and believe that the foundations of our discipline must be empirical in the same way as are those of biology and physics. These two views have both been with us for a long time: witness, for example, the disagreement a century ago between the rationalist Heymann Steinthal and the empiricist William Dwight Whitney. Although I have a clear preference, in keeping with the attitude described in §0.1 I do not here venture to declare that one of the views is right and the other wrong, nor even that both are right (or both wrong). Instead, I simply announce that the one adhered to throughout this essay is the second.

But that still leaves considerable choice as to how we proceed.

Among investigators who take the empirical approach, it is a habit of long standing to refer to the members of a speech community as SPEAKERS. In conformance with that usage, and perhaps partly because of it, the discussion of language design has usually focused on the producer of utterances rather than on any other participant in the communication process. Chomsky hinted at a more balanced view some years ago when he replaced the term language-SPEAKERS by language-USERS, but he seems never to have followed up on the possible consequences. Here we do: we consider language-in-action primarily from the point of view not of the speaker but of the HEARER.

To be sure, this approach is not unprecedented, but it has generally received short shrift. I am convinced it has much to teach us. For me it has clarified several issues that would otherwise have remained puzzling. On the other hand, some aspects of language cannot be discerned at all from this perspective, since they are hidden behind more prominent features in the foreground. For those we resort, as necessary, to other approaches.

Our fundamental question can be phrased as follows: WHEN WE HEAR SOMEONE SAY SOMETHING IN A LANGUAGE WE KNOW, HOW DO WE KNOW WHAT IS SAID?

That may suggest we are headed into a study of the psychology of language rather than of language itself. I prefer to say only that we are moving IN THE DIRECTION of the psychology of language. I think one can go a long way in that direction before one finally reaches anything to which the psychologists would stake an exclusive claim, and I shall not intend to go that far.

It is of course possible, and perfectly legitimate, to define linguistics in such a narrow way as to preclude our question (surely that was Bloomfield's mature preference). Our heritage of two centuries of research and field experience enables us, today, to observe, analyze, and describe any language in the world in just as much detail and with just as much precision as we wish and have time for. On the basis of such descriptions we can generalize and typologize; by comparing certain of them in a different way we can reconstruct ancestral stages and describe how specific languages have changed in course of time; and from such diachronic data we have achieved a firm understanding (except for one point still in dispute) of the major kinds and mechanisms of language change. What is more, all of this can be done, and has been done, without seemingly saying anything at all about the properties of the organisms that manifest language behavior.

Between linguistics, thus narrowly conceived, and psychology in an equally constrained sense, there is a region for which I have no name but which I think is the appropriate place for the development of a THEORY OF HEARING AND SPEAKING. My aim here is to work toward the formulation of such a theory. The staging area for the venture is just linguistics: that is, no psychology — at any rate, none of the special assumptions of any one school of psychology — but just our understanding (however limited it still remains) of how language works. The ability to use language implies the possession of certain capacities. Our move away from linguistics proper in the direction of psychology is limited to an attempt to infer what those capacities must be.

0.3. Prospectus. Terminology is always a problem. For researchers, writers, and readers alike, an efficient terminological system is a well engineered road

that speeds them on their way — provided they want to go where it takes them. For those who prefer to explore cross-country it is not a help but a barrier. I have therefore assiduously avoided the verbal and diagrammatic frames of reference of any contemporary school of linguistic theory, choosing instead the most time-worn and colorless terms I could find, using as few of them as possible, and trying to introduce each in a serviceable defining context.

But at the outset there are a few common terms that we must take for granted (subject to subsequent revision and refinement). In particular, everybody knows what a WORD is, and the lay notion, though vague, will serve our needs until deep into the exposition. The traditional conceptions of SYNTAX and MORPHOLOGY assign to the former the ways in which words are used in and as utterances, to the latter the patterns of formation of individual words; these definitions will also work for us, even though the boundary between the two compartments can be no sharper than our definition of "word."

We start with syntax (chapters 1-3); go to words (4-6), to morphology (6-7), to meaning (8), and finally shift the focus briefly from listening to speaking (9). In chapter 5, when the main line of argument has properly set the stage for it, we also turn our attention briefly to phonology.

You will find one major innovation in the treatment of syntax, one in the discussion of morphology, and considerable turmoil about phonology.

The new slant on syntax is a realistic alternative to the cumbersome and (in my view) arbitrary machinery of transformations and their progeny in the diversified transformational-generative traditions. I was put on its trail about ten years ago when I found myself asking the seemingly very odd question, "WHERE is deep structure?" — only to realize that I had had the essence of the answer in the early 1950s, several years before I invented the term "deep structure," but had then had my attention diverted.

The treatment of morphology here is a corrective for what I think has been a fundamental error in our theorizing (on this side of the Atlantic) for several decades; my suspicions about this also date from about 1950.

The phonological questions in chapter 5 are ones I long thought I had answered definitively, even if not to everyone's satisfaction, years ago. But the new angle of approach has forced me to abandon those answers, without being sure how to replace them. In the chapter I set forth what is involved and suggest tentative conclusions; fortunately, the residual uncertainty in this part of the essay does not much affect the argument in the rest.

1. THE SHAPE OF SPEECH

1.1. The Dimensions of Syntax. In classical Greek, the term σύνταξις, whence our modern *syntax*, meant a setting-out in orderly array of either soldiers or words.

The order one can achieve depends in part on the site. On a parade ground, troops can be maneuvered in neat rows and columns. When the Persian army reached Thermopylae in 480 BC nothing like that was possible; the pass was too narrow. On a plain or at sea, one can try to encircle the enemy. In star wars each ship has three degrees of freedom of motion instead of two, so encirclement is meaningless; only englobement will do.

These are all matters of SYNTACTIC DIMENSIONALITY: the geometrical properties of the space in which soldiers, or words, are to be deployed.

Speech is one-dimensional. No matter how large our army of words, in speaking we dispatch them through a Thermopylae so narrow that they must go single file. Given two words, *U* and *V*, the only possibilities are that *U* precede *V* and that *V* precede *U*. They cannot be simultaneous; they cannot be lined up in space instead of in time.

1.2. Order. That it can matter which comes first is clear from pairs like these:

> match book : book match
> red hot : hot red
> follows page 18b : page 18b follows
> race horse : horse race
> dog bites man : man bites dog

Of course, languages are not all like English. Latin is sometimes said to have had "free" word order. It is true that whether one said *canis virum mordet* 'the dog bites the man' or interchanged the words 'dog' and 'man' and said *virum canis mordet*, the identifications of biter and of bitten remained the same. (To reverse the roles, one altered not the word order but the individual words, changing *canis* to *canem* and *virum* to *vir*.) But that does not mean that word order in Latin was of no importance. There is more to meaning than just the identification of the actor and the goal of an action. The two Latin sentences differed in emphasis, and the speaker uttered the one or the other according to what emphasis was wanted.

Actually, order is never totally irrelevant — a point we might as well make right now and get out of the way. To be sure, by an act of will a difference can be set aside for specific purposes. Such an act is demanded of us in

childhood when we learn arithmetic. The teacher insists that *two and three* and *three and two* are the same. And so they are — but that is a very special NUMERICAL sameness, achieved precisely by agreeing to ignore anything in which the two expressions differ. In other contexts those differences come to the fore. Suppose someone asks you how many children you have, that you answer five, and that they then say *How many boys and how many girls?* Unless in fact you have two sons and three daughters, it would be deceitful to respond with *Two and three.*

1.3. Spacing. In speech, given syntactic linearity, so that *UV* and *VU* are the only possibilities, and assuming that no third word intervenes, there is nevertheless an additional factor: *U* and *V* can be closer together or farther apart. How many degrees of separation are distinctively different may depend on the language. I suppose that if they are excessively far apart — say, *U* today and *V* tomorrow — then they are not likely to be perceived as having anything to do with each other. Setting aside that extreme, it is not hard to show that English has at least a two-way contrast:

If you're fat, don't eat; fast.	: If you're thin, don't eat fast.
I don't think; I know!	: I don't think I know either.
They will find them enormously destructive and maybe cruel to their pets.	: They will find them enormously destructive and may be cruel to their pets.
The largest and most luminous objects known, galaxies and quasars were discovered only in the past fifty years.	: The largest and most luminous objects known, galaxies and quasars, were discovered only in the past fifty years.
I saw the two women, the mother and the daughter. (*Two people in all.*)	: I saw the two women, the mother, and the daughter. (*Four people in all.*)
One nice hot June day, the day after I graduated from high school, I told her to go to hell, and beat it.	: One nice hot June day, the day after I graduated from high school, I told her to go to hell and beat it.

Especially amusing is this one:

That bright red rose—I see its thorn. I disregard the scent it gives off—that's nothing! I hate the scratches I got before; I fuss about the pain, too. Much I think of the beauty!	: That bright red rose I see; its thorn I disregard. The scent it gives off, that's nothing I hate. The scratches I got; before I fuss about the pain too much, I think of the beauty.

1.4. Direction; More Dimensions. We have compared words being uttered with soldiers passing through a defile. But there is a crucial difference: the soldiers can turn around and retreat; the words can't. In speech you can move in only one direction: from earlier to later. The syntax of speech is not only unidimensional but also UNIDIRECTIONAL. When, henceforth, we characterize speech (or any other system) as LINEAR, we shall mean just this combination, unidimensionality and unidirectionality.

There are communicative systems that are like speech in their syntactic dimensionality; for example, West African drum-signaling. There are also systems that are very different.

Consider writing and drawing. A sheet of paper, or the wall of a cave, affords a flat expanse on which marks can be set out: two dimensions instead of the one of speech, but both of them spatial, with no inherent direction. The ears can "move" only from earlier words to later ones; the eyes can turn from any part of a graphic display to any other part—and back again. That is because speech, happening in time, vanishes as it happens, whereas marks on a flat surface are more or less durable.

Writing exploits the durability, but not the dimensionality. To make a writing system work, special conventions have to be established that nullify much of the geometric potential. The surface is divided into narrow strips, and a single line of marks is inscribed in each strip. The eyes are not to flit freely from point to point, but are to examine one strip at a time, scanning the marks in it in a specified direction and moving from strip to strip in an equally arbitrary but conventionally fixed order. Of course, the eyes can skip "back" to reread an "earlier" passage — and the words in quotation marks give the game away: the conventions have linearized the display, thus forcing its geometric properties FOR A READER to match those of speech. There is no clearer evidence that writing is, at bottom, derived from speech than the inescapability of this imposed reduction of dimensionality.

Not all the marks we put on surfaces are writing in the strict technical sense of a representation of speech, and some of them are very different indeed. Yet even in some of our surface-marking practices that seem most closely allied to writing, we exploit syntactic two-dimensionality.

In mathematical notation, two-dimensional arrays are commonplace, and if any two entries in such an array are interchanged the meaning (whatever it is in the particular context) is altered. Thus, no two of these are equivalent:

$$\begin{vmatrix} a & b \\ c & d \end{vmatrix} \qquad \begin{vmatrix} b & a \\ a & c \end{vmatrix} \qquad \begin{vmatrix} c & d \\ a & b \end{vmatrix}$$

Likewise, the following four are all different, though, except for the enclosing parentheses in the last, they involve the same pair of letters:

$$a_n \qquad\qquad an \qquad\qquad a^n \qquad\qquad \binom{a}{n}$$

The first, "a-sub-n", would usually be the label for the last of a series of n things. The second would in most contexts denote the product of a and n. The third means a to the nth power: n a's multiplied together. The last is one of the standard notations for the number of combinations of n things taken a at a time. Again: in a few cases vertical alignment means 'or': thus, "$<$" 'less than' and "$=$" 'equal to' are combined in "$\leq$" to yield the meaning 'less than or equal to'.

But one need not turn to anything even as slightly esoteric as mathematics for examples of two-dimensional syntax. It is obvious, though of no profound importance, in such forms of graphic play as crossword puzzles and acrostics, and in verses where the first letters of the successive words spell a significant word, or in which the words along the major diagonal (first word of first line, second of second, and so on) form a key sentence, or the like. Lewis Carroll's poem "The Mouse's Tail" (in *Alice*) was originally written in lines arranged to look like the tail of a mouse, thus adding a visual pun to the verbal one (figure 1).

Much nearer home, look at any addressed envelope (figure 2). An interchange of the location on the envelope of the two addresses would lead the postal service to deliver the letter to the sender instead of to the intended recipient. Until the stamp is canceled, the arrangement AND NOTHING ELSE specifies who is transmitting the letter to whom. This arrangement, with the meaning all agree on, is a CONSTRUCTION. just as is the arrangement of adjective first and noun second, the adjective modifying the noun, in *black cat*. At the same time, the envelope shows us how formal constructions merge imperceptibly into the "mnemonics of location" of everyday life: the meaning of a business letter depends on whether it is in the in-basket, the out-basket, or the waste-basket; if we find a string on our finger we try to recall what we put it there to remind us of, but a string in a kitchen drawer gives rise to no such cogitation.

Beyond the two-dimensionality of surfaces we come to the purely spatial three-dimensionality of sculpture and architecture, and to the different three dimensions (two of space, plus time) of the silent screen. Beyond these is the four-dimensionality of pantomime, of parlor charades, of the football official signaling an infraction and penalty, and of such gestural-visual systems as Ameslan (American Sign Language for the Deaf). And to any of these except the last, one may append a "sound track," increasing the dimensionality even more.