CHAPTER 1

Language, Thought, and the Linguistics Wars

> Language and our thought-grooves are inextricably related, are, in a sense, one and the same.
>
> Edward Sapir

> Every utterance is deficient—it says less than it wishes to say.
> Every utterance is exuberant—it conveys more than it plans.
>
> José Ortega y Gasset

"Never eat more than you can lift," advises Miss Piggy; or, to quote the somewhat less voracious Ms. Anonymous, "Don't bite off more than you can chew." Putting aside the differences of scale which give these cautions their flavor, we get a very clear warning, one whose kernel is so apparent that paraphrase only mangles it. But it's not an especially easy warning to follow, especially for juicy topics. And we are pulling up to a spread of the juiciest topics associated with the human mouth: the commingle of meaning, noise, and power bundled into the word *language.* Every morsel on the table savours of faraway regions, deep, mysterious, compelling; even the gustatory metaphor we currently find closing in on us. Perhaps another paragraph will help.

Language is the subject and the object of this book. It is the method and the material, the product and the process, the chisel and the stone—points which, language being what it is, often slip noiselessly away while more immediate matters occupy us, but which, language being what it is, also lurch crashing from the shadows when we least expect it. Sometimes we seem to look right through language, hear right past it, and apprehend directly the ideas beneath the writing on the page, behind the words in the air; sometimes we can't get it out of the way. Sometimes another paragraph helps.

Sometimes not.

But always weaving in and out, off and on, through and through the discourse, are the infinite, indescribably subtle sinews that bind language and thought. As Miss

Piggy and Ms. Anonymous demonstrate, separating the idea from the vehicle is not a job for the faint; nor, in fact, for the sturdy. We can say that Miss Piggy's and Ms. Anonymous's expressions mean the same thing, despite the significant difference in their specific words. We can even say they both mean the same thing as the Scottish proverb, "If ye canna see the bottom, dinna wade." Moreover, we can state that 'same thing' as "Don't tackle a job beyond your capacity," or, more baldly, as "Do not do something which is not within your abilities," or, more baldly,

$\forall x \forall y \neg((\text{HAVE (YOU (ABILITY}x)) \,\&\, \text{NEED (TASK}y \text{ (ABILITY}x)) \supset \neg\text{DO (YOU (TASK}y)).$

But, of course, we are only moving around in language, trying to hold the thought steady. We haven't peeled away the language to get at the thought; indeed, we've mangled the thought a bit with every translation. We can also move around in thought, trying to hold the language steady—by setting out the meanings of an ambiguous word, like *bank* or the meanings of an ambiguous sentence, like "Roberto saw the man from the library" (Roberto could be looking out the library window and see the man, or he could be walking down the street and see a man he knows from the library), or an ambiguous discourse, like *Hamlet.* The rub here is that, despite important similarities, *bank* is not the same word when it refers to a place where you keep your money and when it refers to land next to a river; the two Roberto-sentences are not the same; your *Hamlet* is not my *Hamlet.* The corresponding rub for Miss Piggy and Ms. Anonymous is that, despite important similarities, their thoughts are not the same.

Language and thought are not identical, since each can be partially manipulated independently of the other; but only partially, and only by willfully ignoring infinite, indescribably subtle sinews.

Something is always lost. Which brings us to linguistics, the science with the unenviable task of disentangling language and thought.

Not all linguists would agree that their science charts the sinuous relations of language to thought, thought to language, nor even that linguistics is a science, nor, if it is, about what sort of science it is. And these disagreements are crucial themes in much of what follows, as is the unavoidable conclusion that linguists are a contentious lot. Take the *dramatis personae* from the story at the heart of this book, the wars fought among (one-time or still) adherents to the principles of the first man in the list:

Noam Chomsky
Ray Jackendoff
Jerrold Katz
George Lakoff
James McCawley
Paul Postal
Háj Ross

The definition for *linguistics* we just gave runs afoul of several of them. Katz and Postal, for instance, regard linguistics as something very much like mathematics, a

pristine formal science without connection to anything as messy as thought. Lakoff and Chomsky both agree that linguistics is very much concerned with mind, and that it is an empirical science, but disagree severely on many specifics, including what it is to be an empirical science. Ross, McCawley, and Jackendoff are in the empirical science camp, but fall between Lakoff and Chomsky on various specifics, depending on the issues. All of these people and issues show up recurrently in the story of the linguistics wars. For now, we will alleviate the sense of discord over fundamental issues by offering a more conventional definition of *linguistics,* one that virtually all linguists would agree to (although with linguists, as with most reflective humans, we can't do without that *virtually*): the study of the links between sound and meaning.

Two qualifications, though, are immediately necessary. First, *sound* is something of a short-hand here for the most accessible elements of language; *meaning,* for the most elusive. That is, *sound* in this definition includes the noises we make, but also stands in for the letters of written languages (like English), the characters of pictographic languages (like Chinese), the gestures of signing languages (like Ameslan). *Meaning* runs the gamut from logical and grammatical concepts (like negation and subject/predicate relations) to the nebulous domains of implication and nuance (like getting someone to close the window by snarling "It's cold in here" at her, enforcing social relations to boot). Sound is the hard currency; meaning is the network of cultural and formal conventions that turns it into a stick of gum at the candy store.

Second, the idea of standing-in is a critical, but implicit, part of the definition of linguistics, so much so that the definition would be more accurately rendered as "the study of the links between *symbolic* sound and meaning." The clatter of a train is a sound that means you should clear off the tracks, but sound and meaning are causally related here, the way a thermometer reading is linked to heat. Symbols—like "Watch out for the train!"—carry their meaning more tenuously, more subtly, more inscrutably.

Such is the tremendous mystery linguists plumb. It can look pretty mundane at times—when the phenomena under analysis are as familiar and vacuous as "Hello" or "Please pass the salt" or "Hot enough for you?"—but it is every fathom as deep as the search for the fundamental bits and pieces of the physical universe or for the guiding principles of life, and it is far more intimately connected with what it means (there's that word again) to be human.

Linguists examine language in a variety of largely opportunistic ways, as physicists examine matter, biologists life, but among their primary methods are those of the surveyor. They carve up the vast territory between sound and meaning into more manageable provinces. The borders between these provinces are frequently in dispute and hang on some very technical issues, only some of which play a role in the linguistics wars, but their existence and their primary concerns are well established. Moving in the conventional direction, *phonetics* concerns the acoustic dimensions of linguistic sound. *Phonology* studies the clustering of those acoustic properties into significant cues. *Morphology* studies the clustering of those cues into meaningful units. *Syntax* studies the arrangement of those meaningful units into expressive sequences. *Semantics* studies the composite meaning of those sequences.

For anyone unfamiliar with linguistics, those definitions are sure to constitute a stew of alien and undigestible terms. As they become relevant to our story, they become clear. But, as a crash course, consider the sentence, "Fideau chased the cat." Phonetics concerns the acoustic waveform itself, the systematic disruptions of air molecules that occur whenever someone utters the expression. Phonology concerns the elements of that waveform which recognizably punctuate the sonic flow—consonants, vowels, and syllables, represented on this page by letters. Morphology concerns the words and meaningful subwords constructed out of the phonological elements—that *Fideau* is a noun, naming some mongrel, that *chase* is a verb signifying a specific action which calls for both a chaser and a chasee, that *-ed* is a suffix indicating past action, and so on. Syntax concerns the arrangement of those morphological elements into phrases and sentences—that *chased the cat* is a verb phrase, that *the cat* is its noun phrase (the chasee), that *Fideau* is another noun phrase (the chaser), that the whole thing is a sentence. Semantics concerns the proposition expressed by that sentence—in particular, that it is true if and only if some mutt named *Fideau* has chased some definite cat.

These details of the linguistic land grants are not especially important in and of themselves, beyond illustrating one of the key uses to which linguists put the divide-and-conquer approach endemic to science, but a trend should be very clear: their direction is from sound to meaning, from accessible to elusive. We start with the observable—clacking tongues, disturbed air molecules, vibrating ear drums—and move toward significance—meaning, content, sense. Phonetics tells us such things as the amplitude, duration, and component frequencies of the speech signal; semantics tells us people use that speech signal to make assertions about a dog and a cat; the intermediate branches chart the growth of meaning. We also move, then, despite the reservations of some linguists, unmistakably toward thought. Indeed, *meaning* is in many of its uses just an alias for *thought;* more specifically, many of its uses tag certain important subsets of thought, the ones which have the most to do with being human. When I say "I mean X" to you, I am saying that "X" is in my head and, by way of my clacking tongue or clacking keyboard, I want it to end up in your head too.

The events at the heart of this book—the work of Noam Chomsky, the semantic rebellion it sparked, and the impact of both on modern linguistics—have everything to do with thought and being human. The story begins with Chomsky's compelling arguments that fundamental aspects of human behavior (linguistic creativity, for instance, and language acquisition) are inaccessible without his innovations. It develops further when his followers, principally Lakoff and McCawley, extend this work much deeper into the territory of thought than Chomsky intended. And it erupts into open warfare when Chomsky, soon abetted by the work of other followers, most notably Jackendoff, retrenches aspects of his work to banish such extensions, repudiating the work of Lakoff, McCawley, and their compatriots. How it ends, even *if* it ends, is controversial, but the received view is that Lakoff and McCawley were routed for irrationality and error, and that linguistics is much the better for their defeat. Perhaps. But, although the name for their movement, *generative semantics,* has become something of a snide joke in linguistic orthodoxy,

one of the aims of this book is to help it regain a bit of its lost virtue—keeping in mind, however, that it deserves some of its shame; Chomsky's camp, some of its glory.

The events at the heart of this book also have everything to do with borders; more specifically, with border disputes. The ones involving phonetics and phonology saw very little action in the debate, but those among morphology, syntax, and semantics—the provinces more directly involved in meaning—were all flash points, and the closer the territory was to the holy land of meaning, the hotter the battles. In extreme, generative semanticists argued that language was one big shmoosh, with no place at all for borders, even in principle; sound was at one end of the linguistic continuum, meaning at the other, and a small group of uniform rules, untagged as to traditional linguistic subdiscipline, mapped one into the other. In extreme, Chomsky's camp, the interpretive semanticists, were demarcation fetishists, redrawing their borders daily; one day a given phenomenon was syntactic, the next day morphological; one day it was semantic, the next syntactic. Each saw the other side as perverse, and said so in graphic, uncompromising terms.

Such internal border disputes are largely a matter of one theory against another, much the same as a dispute between a cloud-like subatomic model and a mini-solar-system model, between fixed continents and drifting ones, between Darwinian and Lamarckian evolution. Generative semantics wanted to leave the language pie pretty much as a whole, describing its shape and texture noninvasively. Interpretive semantics wanted to slice it into more manageable pieces. But as the battle became more fierce another border dispute arose, an extra-theoretical one, concerning the definition of the entire field, the scope of language study, the answer to the question, *What is linguistics?*

Every science needs to rope off those phenomena for which it can reasonably generate explanatory theories. Nature, it has been clear since at least Heraclitus, is in dizzying flux, abuzz with colliding, chaotic, blurred events; it is a universe of infinitesimal detail and immeasurable vastness. Our senses have adapted to this by tuning to only a tiny range of those events, the ones most relevant to our survival and propagation. We see only a certain narrow band of light frequencies, hear only a small range of sound, smell and taste and feel only the grossest of data. Everything else we filter off, ignore. Sciences do exactly the same thing. Collectively they have overcome many corporeal limitations, augmenting our senses astonishingly well, but they also make even more exclusive choices than our senses. Even in the outlandishly general schemes of some physicists, currently working on a Theory of Everything, only the narrowest of phenomena would be covered; a Theory of Everything would not explain, for instance, a moth drawn to a flame, a wolf baying at the moon, a physicist writing a grant proposal. Nor should it. Science, like any other form of apprehending the world, would be impossible without its self-imposed limits.

Chomsky argued forcefully that in linguistics such limits should be drawn between the knowledge of language and the use of language. Consider the difference between knowing how to play chess and making a specific move. The first is relatively tidy—the rook goes horizontally and vertically, the bishop goes diagonally,

the knight does a buttonhook. The second depends on a welter of ephemeral conditions—past moves, adversarial skill, emotional state, even the amount of light on the board or the cough of a spectator. The first can be described comprehensively by a body of rules. The second can only be described broadly, and never predicted with anything approaching certainty by an observer. In language, knowledge is relatively stable after childhood acquisition, though vocablary and conceptual knowledge grow and decay, while use is subject to all the vicissitudes of life—stress, distraction, altered states of consciousness. A speaker who knows the pronunciation of *two* and *martinis* might still claim to have had only "tee martoonies" if pulled over for erratic driving, especially in a 1950s sitcom. Chomsky and the interpretivists felt the only way to isolate tractable problems for linguistics was to focus on knowledge and filter off the ephemera of use.

Generative semanticists found this approach absurd and arbitrary, regarding accounts of linguistic knowledge to be completely artifactual when separated from the application of that knowledge, its use; McCawley's analogy for the interpretivist separation of form and function was to a theory of the stomach which ignored digestion. And, of course, however worthy the metaphors, language is neither chess nor digestion. It is far messier and far less exact than chess, far more ramified than digestion, though perhaps not so messy: separating knowledge from use is not easy. In extreme, generative semantics said there was no defensible separation. Responding appropriately to "Hot enough for you?" was the same for them as a rule for making sure pronouns matched their antecedents. In extreme, interpretive semanticists shifted their definitions daily. Yesterday's knowledge was today's use; today's use, tomorrow's knowledge. Again, each side saw little more than perversion in the other's methodological proclivities.

The story, then, is in large measure about how much is too much, about how big a bite of language is more than linguistics can chew. Chomsky charged the generative semanticists with gluttony beyond even Miss Piggy's broad constraints, of trying to swallow every conceivable thing with the most oblique relation to language. The return accusation was that interpretive semanticists took only conservative, tasteless, nutritionless little nibbles from the immense, and immensely challenging, human phenomenon, language.

The data of this dispute included such things as sentences and their meanings. So, for instance, sentences like 1a and 1b were important in the germinal stages of the debate; sentences like 2a, in its death throes.

1 a Everyone on Cormorant Island speaks two languages.
  b Two languages are spoken by everyone on Cormorant Island.

2 a Spiro conjectures Ex-Lax.

The issue and appeals surrounding 1a and 1b are very narrow, highly technical, and revolve exclusively around the formal machinery required by the competing theories to explain their different implications for Cormorant Islanders: 1a implies a world where they are all bilingual, but the languages they speak might be quite diverse; 1b implies a world where they all speak the same two languages (say, Kwakwala and English). Sentence 1a could be true in circumstances where 1b was false,

and vice versa. The issues and appeals surrounding 2a are very wide, relatively informal, and revolve around much bigger questions than which theory is better; they ask, What is language? and What is linguistics?

By the time these questions surfaced, the interpretive-generative semantics differences had outgrown and exhausted the term *debate.* What began as a compact, in-house disagreement over a single hypothesis within Chomskyan linguistics had mushroomed into foundational proportions. Both sides saw the relevance of 1a and 1b very clearly, and both sides saw a resolution within reach. But the years of acrimony and diverging arguments between those sentences and 2a had altered their vision. Interpretive semanticists didn't even see 2a as data, and regarded its invocation by the other camp as clear and damning evidence they were no longer doing linguistics; generative semanticists saw 2a as the crux of an *experimentum crucis,* and saw its dismissal by the other camp as clear and damning evidence that they were practicing a brand of linguistics so sterile and navel-contemplative that their work was completely hollow. Even the political and whimsical elements of 2a chart the chasm that had grown between the erstwhile companions.

Simply put, the chasm stretched between consensus and dissensus, although these terms are not particularly simple. When 1a and 1b were relevant to our story, all the arguers agreed closely about their implications, and about what sort of enterprise linguistics should be; with 2a, there was so little agreement that *arguers* hardly applies. But this picture only catches the grossest image of the conflict, the shadows on the wall. In the mid-sixties, with the two-languages sentences, interpretive and generative semanticists agreed with one another about how to study language, certainly, but they disagreed collectively with their immediate predecessors. By the mid-seventies, with Spiro's laxative conjecture, they disagreed with one another, but now the generative semanticists began to find points of agreement with pre-Chomskyan linguists. This shifting ground of agreements—that is, history—forms not only the defining backdrop for the interpretive-generative semantics dispute, but for all the *whys, whats,* and *hows* of language study. The issues which crystallized in the divergences of Chomsky and his former disciples echo back through the centuries to other controversies, other clusters of assent and dissent, back to the earliest investigations of language, back to the birth of linguistics, and science, all of which we will get to anon.

Before we do, though, Spiro is still on the table, and we should clear him away: the nub of 2a is that it is hopelessly nonsensical in isolation (the way interpretive semanticists always preferred their sentences), but is perfectly fine in context (the way generative semanticists grew to prefer their sentences); namely, as a response to the question in 2b.

2 b Does anyone know what Pat Nixon frosts her cakes with?

CHAPTER 2

Linguistics

> Linguistics, in the widest sense, is that branch of science which contains all empirical investigations concerning languages.
>
> Rudolph Carnap

> To put it briefly, in human speech, different sounds have different meanings. To study this co-ordination of certain sounds with certain meanings is to study language.
>
> Leonard Bloomfield

The Science of Language

Linguistics is, concisely but not uncontroversially, the science of language. There are various circumlocutions available, if necessary, but language is unquestionably the object of study, and *scientific* best captures the spirit of investigation common to almost everyone who has examined that object in a way that (currently or retrospectively) fits the term, *linguistic*. Other approaches to studying language, and there are many, go by names like *poetics, philology,* and *rhetoric,* but as long as we have had the word in English, *linguistics* has been associated with the methods, goals, and results of science.[1] When William Whewell (who is also responsible for the coinage, *scientist*) first proposed the term, it was in his *History of the Inductive Sciences* (1837.1:cxiv; he was borrowing it from the Germans, who, Teutonically enough, later came to prefer *Sprachwissenschaft*).

Ultimately, the matter of linguistics' fit to the category of science (or, in terms more befitting the charismatic power of *science* in the twentieth century, the matter of linguistics' merit for the status of science) is a pretty trivial one. Clearly there are compelling reasons for linguists to emulate workers in disciplines like physics, chemistry, and biology—the prototypical sciences. Physicists, chemists, and biologists have been immensely successful, producing vast quantities of results about the natural world.

There are also some striking parallels between linguistics and these other sciences, and the stronger those parallels are—the closer linguistics is to these pursuits

in methods, goals, and results—the more confidence we have in giving it the label, *science.*

But, more crucially, each intellectual domain requires a certain measure of integrity, and there are equally compelling reasons not to emulate these fields too closely or too blindly. The object under investigation must be allowed to guide the analysis, and a syllable is not a quark. A meaning is not a molecule. A sentence is not a liver.

Nor does linguistics need the nominal blessing of *science.* It is some sort of systematic, truth-seeking, knowledge-making enterprise, and as long as it brings home the epistemic bacon by turning up results about language, the label isn't terribly important. Etymology is helpful in this regard: *science* is a descendant of a Latin word for knowledge, and it is only the knowledge that matters.

Having said all that, however, there is certainly a range of methods, goals, and results that places such pursuits as literary criticism, philosophy, and history at one end of a continuum of knowledge-making pursuits; physics, chemistry, and biology at the other. For lack of a better term, we can call the criticism and philosophy end *humanities.* For lack of a better term, we can call the physics and chemistry end *sciences.* And defining linguistics as "the science of language" acknowledges that it falls much closer to the physics end than the criticism end. Its methods, goals, and resilient results come from a long tradition of treating language as a natural object—sometimes a social object, sometimes a mental object, sometimes both, but always as something which could be observed, like the stars and the rocks, and sometimes poked, like the animals and the plants.

Sound and Meaning

> Speech is meaning—an incorporeal thing—expressed in sounds, which are material things.
>
> Ernst Cassirer

Although the formal study of language dates at least back to the Akkadians, and there was surely campfire linguistics—Fred and Barney must have had some way of talking about talking, or what they were using wouldn't have been language—the winds of time have erased all but a very few vestiges of pre-Hellenic work. We can start with the Stoics, who, among their other activities, systematically investigated language as an object in the natural world. They were philosophers, and rhetoricians, and political scientists, and proverbial tough-guy fatalists, but they were also linguists.

Linguists *qua* linguists are interested in language in and of itself, the way a physicist is interested in matter, or a biologist in life. This statement, as simple as it is, actually conflicts with the stated goals of a great many linguists, including several who take center stage in our story. Noam Chomsky, in particular, says flatly and often that he has very little concern for language in and of itself; never has, never will. His driving concern is with mental structure, and language is the most revealing tool he has for getting at the mind. Most linguists these days follow Chomsky's lead here. The subtitle of George Lakoff's major book, for instance, is *What Categories Reveal about the Mind,* and Ray Jackendoff, who works in a department of

cognitive science, has one entitled *Semantics and Cognition;* in general, linguists regard their discipline now as a branch of psychology. For most of this century, though, linguists had quite different allegiances, seeing their discipline as a branch of cultural anthropology. Earlier yet many linguists had frankly theological goals—historical linguists in the nineteenth century were after the one "pure" Adamic language, spoken from Eden to the collapse of the Nimrod's tower, and the Medieval Modistae used language to map the hidden structures of creation.

But, of course, scientists almost always hold distant goals while they work on more immediate data and theories, especially religious goals. Astrophysicists like Kepler and Newton and Einstein were trying to uncover the workings of God in nature, as are more recent physicists with much different notions of God and nature, like Capra and Zukav; even the church's biggest bogey men—Galileo and Darwin—portrayed their research as branches of natural theology, revealing the subtlety and beauty of God's handiwork. Quasi-secular motives are also popular with scientists, particularly in this century, like high-energy physicists looking for the beginning of time or the tiniest bits of matter, or molecular biologists looking for the secret of life. Whatever their ultimate motives, though, physicists look at matter, biologists look at organisms, geologists look at rocks. That is where they go for their data, what they seek to explain with their theories. Linguists look at language. That is where they go for their data, what they seek to explain with their theories.

The most frequently invoked definition of *linguistics,* a version of which begins this section, calls language a path running from sound to meaning, and calls linguistics the exploration of that path. The Stoics were the first to formalize the two end points of this path, "distinguishing between 'the signifier' and 'the signified'" (Robins, 1967:16), an utterly fundamental insight, the first principle of linguistics. The scientific approach to language has uniformly proved more valuable for exploring the sonic side of the split (the signifier), including the arrangement of sounds into words and sentences. The meaning side of the divide (the signified) has remained shrouded in speculation, and many of the most substantial contributions have come from philosophers, but linguists have always found the prospect of getting at the signifieds very compelling. The Stoics were also the first to identify distinct areas within the study of signification—phonetics, morphology, and syntax.

These were major advances, establishing the parameters of linguistics as an autonomous pursuit, and the key to these advances was clearly the same as the key to Greek advances in cosmology and mechanics: abstraction. Language is so intimately tied to consciousness, reason, and being human, that it is difficult for many thinkers to detach themselves to the point where they can look at it in general rather than specific terms. But the Stoics flourished at a time when contacts between Greek speakers and non-Greeks were on the rise; indeed, the head Stoic's (Zeno) first language was Semitic. This exposure forced the Stoics to realize that there was nothing inherent to the sound of a word or the pattern of a sentence which carried the meaning. There is nothing inherent in the sound of *chien,* or *Hund,* or *dog,* that evokes a loyal, barking quadruped; rather, as the Stoics found, the links between signifier and signified are the product of convention, consensus, and reason.

The Stoics also participated in an important controversy about language, which

historians tag with the words *analogy* and *anomaly*. The analogists saw language in terms of order and regularity; the anomalists saw it as far more haphazard, particularly in the domain of meaning. The participants in the debate did not cut the pie this cleanly, and the issues were not even delineated very precisely until Varro reexamined them in the first century B.C. History has not treated this dispute with much sympathy, and it is easy to see why. "The business of science," as Russell tells us, "is to find uniformities" (1967 [1912]:35), so the position that language is fundamentally haphazard is tantamount to abandoning science. If order is illusory or superficial, there is no point in looking for patterns—in systematizing, or classifying, or abstracting. Indeed, abstraction is unthinkable in a world of totally unique objects; more importantly, such a world is itself unthinkable, since our brains are fundamentally pattern detectors.

The Stoics, curiously enough, were pretty much in the anomalist camp. But the positions were neither rigid nor absolute—rather, they were "two attitudes to language, each in itself reasonably justified by part of the evidence" (Robins, 1967:19)—and the Stoics were reacting to analogists who over-generalized, ignored data, and attempted to prescribe usage. The Stoics were empirical, with a healthy respect for the complexity of language—an important cornerstone of their advances was rejecting the simple equation of one word with one meaning. They were also less concerned than the analogists with issues of linguistic "purity," and correspondingly more tolerant of dialectal variation. The dispute subsided with the discovery of more regularities in language, such as the critical distinction between inflectional morphemes and the semantically heavier, more idiosyncratic, derivational morphemes, and with the general neglect of meaning. In short, it was settled, quietly, in favor of the analogists, though it has flared up consistently in virtually every other divisional debate in linguistics, and it plays an especially critical role in the generative-interpretive schism, when one camp became consumed with semantic questions and pursued language deep into irregularity and chaos while the other stayed safely near the surface.

A crucial term—*formal*—has snuck into the discussion in several places, and it signals the last criterial lesson we need to take from the Greeks. *Formal* has a nasty ring about it for some linguists (mostly linguists opposed to Chomsky's program, though others attack him for not being formal enough), but it is absolutely essential to linguistics, as it is to any science, and means nothing more than codified abstraction. For instance, /str/ is a representation of an abstract sound string, an instance of which occurs in the pronunciation of *string*. *String* is an expression in the formal system of English orthography. "NP + VP" is a formal expression which represents the syntactic structure of the previous sentence (since it contains a Noun Phrase followed by a Verb Phrase). And so on. The Greeks explored the abstract codification of language, adapting the Phonecian alphabet and using it to carve up the relatively continuous acoustic waveforms of speech into discrete sentences, phrases, words, morphemes, and phonemes.

The Greeks stayed pretty close to the sonic (and graphic) aspects of language, as did their Roman and early Medieval grammatical descendants, but the study of language veered sharply off toward more obscure matters when classical grammar met up with the unique brand of Aristotelian thought in the high Middle Ages

known as *Scholasticism.* In modern terms, the resulting synthesis is probably closer to one of the humanities, philosophy, than to natural science, but in the terms of the period the Modistae were rigorously scientific, and, also like philosophy, had significant ties to a formal science, logic. They got their name from a collection of representative writings entitled *De Modis Significandi,* and significance was their defining concern, but they were more generally interested in the threads weaving among *modi essendi* (the ways things are), *modi intellegendi* (the ways we conceive them), and the titular *modi significandi* (the ways we express them): in short, among reality, thought, and language.

"No idea is older in the history of linguistics," Pieter Seuren writes, "than the thought that there is, somehow hidden underneath the surface of sentences, a form or a structure which provides a semantic analysis and lays bare their logical structure" (1973 [1971]:528); with the Modistae, this thought became the driving concern. Modistic grammar is best characterized by the systematic extension of formal logic to the study of language, and by the adoption of Aristotle's preoccupation for causation. In a mood swing typical of most intellectual pursuits, the Modistae jumped all over their predecessors for not looking deeply enough into causes, with settling for mere taxonomy when explanation was required.

The general explanation to which their rigid deductive methodology led strikes moderns as somewhat mystical—that there is a universal grammar underlying language which is "dependant on the structure of reality" (Bursill-Hall, 1971:35)—but it is the consequences of this position that are relevant. The Modistae were far more concerned with abstracting general principles of language than the ancients (who tended to look for general principles of individual languages, particularly Greek). Roger Bacon, for instance, said that there were problems specific to a given language, and problems common to all languages, and only the latter were of scientific interest. As a natural extension of this approach, they came to the position that all languages were in essence the same, and "that surface differences between them are merely accidental variations" (Robins, 1967:77), a position we will see again. In the standard definitional schema of the field, which sees linguistics as the investigation of links between the signifier and the signified, the Modistae were a great deal more interested in the links at the signified end of the chain than in the accidental variations of the signifiers. Indeed, they ruled all matters directly concerning sound completely out of the realm of grammatical study.

The scholastics were the victims of a rather violent mood swing themselves. They were driven from the intellectual scene by the increased concern for empirical research and mathematical modeling that marks the beginnings of modern science, and the work of the Modistae was largely forgotten. Jespersen's survey of linguistic history, for instance, dismisses the entire Middle Ages in two sentences (1922:21), and Modistic grammar had very little direct influence on modern linguistics, aside from some terminological remnants. But its indirect influence is substantial: Chomsky studied the Modistae as a young man, and it shows. Modistic grammar also had an impact on Renaissance philosophers of language, especially the Port-Royal school that Chomsky has warmly acknowledged as an intellectual forerunner of his program.

The next critical step in the history of linguistics, and the one generally taken to

mark the emergence of "modern linguistics" comes with the famous chief justice of Bengal, William Jones, in his 1786 Third Annual Discourse to the Royal Asiatic Society, in which he suggested that Sanskrit, Latin, and Greek were all the descendants of "some common source, which, perhaps, no longer exists," and that Gothic and Celtic might have similar roots. There had already been substantial work done on Sanskrit; there had been debate about classification, genetic relations, and hypothetical sources, and the proposal of a common source for Sanskrit, Latin, and Greek had even been advanced. But Jones's paper is a convenient crystallization for historical purposes, because it draws all these threads into a succinct discussion; it was even commonplace for quite some time to view Jones's paper as the dividing point between the pre-scientific and scientific periods of language study.[2] The work which came to a head in Jones's address rapidly hardened into the paradigm known as *comparative linguistics.*

The comparative method was extremely simple, though its results frequently depended on staggering diligence and an astonishing breadth of knowledge. Linguists just looked closely for packages of sound and meaning in one language which were similar to packages of sound and meaning in another language and worked out explanations for the similarities. The process is exactly parallel to that of other observational sciences, like astronomy and paleontology; indeed, Kiparsky (1974) calls its practitioners *paleogrammarians.*

In some cases, the explanation of similarity the comparativists came up with might be that a word was adopted by neighboring language groups, in other cases the correspondences could only be explained as coincidences, but it became very clear that many of the European and West Asian languages were "related," descendants of the same parent. The most famous demonstration of these relations is Grimm's law (which, however, Jacob Grimm simply called a "sound shift," not a law, and which Rasmus Rask had observed before him), accounting for the parallels among, for instance, Latin *pater,* German *Vater,* and English *father,* and among Latin *piscis,* German *Fisch,* and English *fish.* The beauty of Grimm's law is that it very neatly identified a major branch of the Indo-European family tree, the Germanic languages, by way of a few simple articulatory similarities (such as the fact that both *p* and *f* are pronounced using the lips), and within a few intense decades, similar insights had established the present configuration of the Indo-European family as a hard scientific fact—solidly among the chief intellectual accomplishments of the nineteenth century.

The comparativist results have withstood the corrosive passage of time remarkably well, but the comparativists themselves were viciously attacked by the self-styled neogrammarians toward the end of the century, in a power shift that many linguists regard as a "false revolution"—in fact, as the prototypical false revolution, all heat, no light—but which is best regarded as a demi-revolution. It affected the data and the scope of the field substantially. The neogrammarians (the most famous being Karl Brugmann and Hermann Paul) attended more widely to contemporary languages and dialects as valuable in their own rights, where the comparativists had focused largely on dead languages, looking to contemporary languages primarily for the light they could throw on the past. This shift also affected the goals and argument lines of linguistics, by turning toward psychological questions and generating

new classes of warrants and appeals. The neogrammarians, for instance, looked for laws rather than regularities, and banned speculation on nonverifiable matters, like the origins of language. They fancied themselves much like physicists; the comparativists' favorite analogy was to naturalists. What this shift did not alter in any interesting way was the bulwark of comparative linguistics' great success, its methodology—the neogrammarian codifications of scientific principles "were largely drawing out what had been implied by [the comparativists' work]" (Robins, 1967:187)—and it had no effect on comparativists' results, except perhaps to strengthen some of them. The other revolutionary shoe fell with Ferdinand de Saussure's monumental *Course in General Linguistics* (1966 [1915]), which initiated the linguistic strain commonly known as *structuralism* (and which, incidentally, is another point that marks, some say, the beginning of modern, scientific linguistics; just as the middle class is always rising, linguistics is always becoming a science).

Structuralism

> The first thing that strikes us when we study the facts of language is that their succession in time does not exist insofar as the speaker is concerned. He is confronted with a state.
>
> Ferdinand de Saussure

Saussure's influence was vast, but somewhat indirect, since his *Course* is a posthumous reconstruction of some of his late lectures by two of his colleagues (Charles Bally and Albert Sechehaye, in collaboration with one of Saussure's better note-taking students, Albert Riedlinger). For the purposes of our Grand Prix review of linguistic history, though, we need to consider only two of Saussure's most ramified conceptual impacts, both idealizations which help to isolate the object of linguistics.

Before Saussure, many people cared passionately about the object of linguistics—language—but no one was particularly concerned about defining it in a rigorous way. Language was just that thing that happened when you opened your mouth at the table, squeezed a few noises out of your vocal chords, and induced Socrates thereby to pass the salt. The Stoics wanted to see what its bits and pieces were—sounds, morphemes, words. The Modistae took some of these discoveries (and ignored others), along with many of their own, and sifted through them for the structure of reality (or, what was the same, the mind of God). The comparativists added time, huge stretches of time, to linguistics, trying to reel it back to the starting point. And all of them had some background notion of what language "really was"—the Adamic tongue, of which only degenerate scraps remained; the blueprint of the universe; or, for the deeply chauvinistic Greeks, Greek. But they weren't especially concerned with defining the perfectly obvious, language. Saussure was.

He was so concerned that he felt almost paralyzed in the face of the neogrammarian continuation of this disregard, telling one of his friends that he couldn't write anything on language because no one in the field knew what they were doing. First he left Leipzig, the center of the neogrammarian universe, for a chair in Paris; then he left Paris, still too close to the misguided mainstream, for the relative obscurity of Geneva; then, before he died, he destroyed most of the lecture notes articu-

lating his notions of language and language study. But, teaching a general course in the linguistic outback of Geneva, he was free of suppositional constraints, and redefined the field.

The first idealization to this end was to separate language from the weight of the centuries the comparativists had laid on it, a weight which pressed heavily on linguists but was wholly unnoticed by speakers in their daily trade of meanings. Saussure distinguished sharply between diachronic linguistics and synchronic linguistics. *Diachronic* literally means *across-time,* and it describes any work which maps the shifts and fractures and mutations of languages over the centuries. In gross outline, it is similar to evolutionary biology, which maps the shifts and fractures and mutations of species over time, and to geology, which maps the shifts and transformations of rocks. *Synchronic* literally means *with-time,* though etymology is misleading here, since Saussure's term describes an atemporal linguistics, linguistics which proceeds without time, which abstracts away from the effects of the ages and studies language at a given, frozen moment. Two other words he used in this regard—*evolutionary* and *static* linguistics—help make the distinction clearer, but they also draw attention to the peculiarity of studying language as if time didn't matter.

Static linguistics is a pretty baffling notion, to which there are no clear analogies in other natural sciences. Ecological biology is similar, in that it looks at the interactions of species at a given time, without too much regard for the selective pressures that gave rise to them, and so is chemistry, in that it looks at the interactions of chemicals, irrespective of their history, but both of these sciences have definite temporal dimensions. The closest analogies, in fact, are to formal sciences, like most branches of mathematics and logic; triangles and existential quantifiers are outside of time. But how can language, an inescapably empirical phenomenon, be the object of a formal science? How can a word be like a triangle? The answers are as problematic as the questions, and we will see a good deal of this issue before we are through, but whatever the in-principle complications are, in practice Saussure's distinction is very workable. In practice, *synchronic* means something like "within a generation," since it is only through the innovations and misunderstandings of sons and daughters, grandsons and granddaughters, that languages change, and Saussure asked his students for a thought-experiment to make this point. "Imagine an isolated individual living for several centuries," he asks. "We would probably notice no change; time would not influence language" (1966 [1916]:78).[3]

Synchronic and *diachronic,* then, refer not to aspects of language so much as perspectives on language.

The key term in Saussure's thought experiment is clearly *isolated.* Even an ageless speaker—Dick Clark, for instance—has to change his speech to keep up with the generational tide. That is, language is a social product, which brings us to Saussure's second idealization, another sharp division, this one between language when it is put to use, hawking records on television, and the system that makes hawking possible. The first, language in use, Saussure called *parole;* the second, the system behind language use, he called *langue.* The difference is roughly the one between the ordinary parlance terms, *speech* and *language,* words which are pretty loose in their own right, but which are, respectively, still the two best English translations

for Saussure's terms; *speech* is more closely associated with talking and listening, *language* with the principles and rules which make the trade of meanings possible when we talk and listen. More abstractly, we might identify Saussure's terms, respectively, with behavior and grammar. *Parole* is verbal activity: speaking, writing, listening, reading. *Langue* is the background system that makes linguistic behavior possible.

The scientific approach to language means, in large measure, taking it to be a natural object, something which exists in nature, and this notion clearly lies in back of Saussure's thinking—in the *Course* language on a few occasions is even called a "concrete object," though there is nothing concrete about it at all. The most concrete aspects of language—acoustic disturbances in the air or characters on the page—are only reflexes, virtually accidental. Certainly the dancing air molecules, the ink and the page, are not what we mean when we talk about language. It is the patterns in the air and on the page, and the network of relations which link those patterns to actions and beliefs. The patterns and their network constitute Saussure's *langue. Parole* is largely a filter for his approach, to screen out the variable, vulnerable, ephemeral echoes of those patterns. *Parole* is, he says, outside the scope and capabilities of linguistics. Saussurean linguistics studies the system, the rules of the game, not the individual moves of a specific contest. (Chess, by the way, was a favorite Saussurean analogy for language.)

There are, it is easy to see, some daunting complications to this style of reasoning. The data must come from *parole,* from people opening their mouths and blurting out significant sounds, but the theories concern *langue,* the system that links those signifiers to signifieds. More troublesome, the signifiers are public items, sensible only in concert with a notion of community; the signifieds are private items, sensible only in concert with a notion of individual cognition. Language is a "social product deposited in the brain of each individual" (Saussure, 1966 [1916]:23). To the extent that language is a natural object, then, there are only two conceivable locations for it to reside in nature, both of them necessary but both of them very amorphous and poorly understood themselves, society and mind. This situation makes linguistics a very Januslike profession, one head facing toward anthropology and sociology, the other toward psychology. (Saussure's thought, in fact, accommodates both heads, but he was strongly influenced by Durkheim, and his overwhelming tendency is to face toward sociology.)

Linguistic theory in Saussure's mode—that is, structuralism—charts the system underlying speech, not speech itself. This system, best known in linguistic circles as *grammar,* now takes center stage.

Sapir, and, Especially, Bloomfield

> Very roughly, the first half of the twentieth century saw the following major theoretical developments in [linguistics]: (1) the confluence, with all appropriate turbulence, of the two relatively independent nineteenth century traditions, the historical-comparative and the philosophical-descriptive, the practical descriptivism of missionaries and anthropologists coming in as an important tributary. (2) serious efforts by Saussure, Sapir, and especially Bloomfield, not only to inte-

> grate the positive findings of these traditions into a single discipline but, even more, to establish that discipline as a respectable branch of science with the proper degree of autonomy from other branches. (3) The discovery and development of the phonemic principle.
>
> Charles Hockett

In North America, where our story now takes us, structuralism took very firm root in the twenties and thirties, and continues to flourish (though the word, *structuralism*, is actually in some disrepute).[4] But it was a home-grown structuralism. As happens so often at critical junctures in the history of science, structuralism was in the air. It was, hindsight reveals, incipient in the neogrammarian moves to introduce rigor and systematicity into comparativist approaches, but several important threads are also noticeable in a number of independent scholars—in particular, in the linguistic work of three guys named Will: the philosopher, Wilhelm von Humboldt; the psychologist, Wilhelm Wundt; and the only American in the group, linguist William Dwight Whitney. Humboldt was one of the few nineteenth-century scholars of language not primarily concerned with its historical aspects, and he was (in a way that partially recalls the Modistae) far more interested in the general properties of language, its system, than his contemporaries. Wundt, who was strongly influenced by Humboldt, wove linguistic interests into his *Völkerpsychologie*—roughly, "cultural psychology"—and *völkerpsychologische* interests into his linguistics. Whitney, who was trained among the German neogrammarians, also had a solid concern for the social-psychological dimensions of language, and, most importantly, argued for a more systematic and independent approach to language (Bloomfield credits him with helping to banish the "mystic vagueness and haphazard theory" of earlier approaches—1914:312). None of these Wills could be called a structuralist, and their contributions to linguistics are quite varied, but they all contributed substantially to the climate which gave rise to Saussure's views and their North American cognates.

The most important figures in the development of American structuralism, far and away, are Edward Sapir and Leonard Bloomfield; and, given the subsequent direction of the field, the most important of these two, far and away, is Bloomfield.[5]

Sapir—and, to a lesser extent, the early Bloomfield—had the cultural-psychological interests of Wundt and Whitney, and he had Humboldt's concern for the general, systematic properties of language, for what he called, after Humboldt, its *inner form*. Without the explicit here-a-distinction-there-a-distinction theorizing of Saussure, he wove from these strands a remarkably parallel approach to linguistic analysis, the specifics of which (in both Saussure and Sapir) would take us too far afield. But there was something else in the weave as well, the most important characteristic separating American linguists from their European cousins, a defining trait best termed "the Amerindian imperative." Sapir's teacher was the intellectual and political juggernaut of U.S. language studies at the turn of the century, Franz Boas, a.k.a. Papa Franz, a.k.a. The Father of American Linguistics. Boas recognized both the opportunity and the obligation that came with the rich, diverse, challenging languages of the Americas—languages very different from the Indo-European tongues which dominated Old World linguistics.

(As a very superficial example of these differences, take the verbs of Kwakwala, a language native to the damp western reaches of Canada, including Cormorant Island. Kwakwala verbs are wholly indifferent to time of occurrence, and needn't be marked for tense in the way most Indo-European verbs are. But they are highly concerned about the authority of the speaker, and have to be marked to indicate the speaker's justification for making a statement about the described action—marked to indicate whether the speaker saw the action, just heard about it from someone else, or experienced it in a dream—a notion highly alien to the languages, and the speakers, of the Indo-European families.)[6]

Much of the earliest research into non-European languages had one or the other, or both, of two straightforwardly rapacious motives: conquest and conversion. Diversity was therefore a problem, something which impeded "the advance of civilization and the labours of the missionary" (Lyell, 1870:461). Grammatical research primarily looked for ways of forcing the concepts of Christianity or of European administration into the native language, so they could be served up later from pulpit or page. This goal, along with haphazard training, a general belief in the racial, cultural, and linguistic inferiority of "primitives," and a warping streak of chauvinism which held Latin to be Pope of all Languages, led to treatments of Amerindian languages almost as barbarous as the treatment of their speakers. Algonquin and Mohawk and Delaware expressions were pounded into categories like dative and subjunctive and partitive-genitive, and what couldn't be pounded into these slots was ignored. Boas and his students had nothing but contempt for this bungling and mangling. Sapir put it this way:

> A linguist who insists on talking about the Latiń type of morphology as though it were necessarily the high-water mark of linguistic development is like the zoölogist that sees in the organic world a huge conspiracy to evolve the race-horse or the Jersey cow. (1922:124)

The reference to zoology is not accidental. Boas recognized and enforced the integrity of Amerindian languages, prizing the collection of textual specimens above all, and steered his students, along with (through his influence at such institutes as the Bureau of American Ethnology) most of the available funds, in a primarily descriptive, data-driven direction. Though other attitudes and other approaches continued, under Boas the sanctioned mainstream of linguistics was what he called the "analytic technique"—to describe languages in their native habitat, extracting the regularities that presented themselves, imposing none from without. (Humboldt, incidentally, was also influential here; he had argued, for instance, that certain Malayo-Polynesian words which looked superficially like European verbs were in fact better analyzed, within their own linguistic systems, as nouns; see Koerner, 1990.) Variety for Boas and his students was not a hindrance, but a cause for celebration, and they also came to have a healthy respect for the various world views bundled up in the diverse Amerindian languages. Boas certainly had, like most scientists, interests beyond the brute facts. He called language a "window on the soul," which was not so much a spiritual definition as a cultural and psychological one. But the overwhelming impact of Papa Franz was to focus closely on languages in

and of themselves; this emphasis made him, for many, "the father of the authentically scientific study of language in North America" (Anderson, 1985:198).

Sapir—isolated, like Saussure, in a cold intellectual backwater, Ottawa—augmented Boas's data-driven program with a theoretically richer, philosophically deeper, but somewhat eclectic approach, developing a uniquely American structuralism.[7] He wrote about the dangers of succumbing wholly to the "evolutionary prejudice" of historical linguistics (1949a[1921]:123), for instance, and he articulated a notion closely parallel to Saussure's *langue,* saying that the defining aspects of language lie "in the formal patterning and in the relating of concepts," and that "it is this abstracted language, rather more than the physical facts of speech" which forms the subject matter of linguistics (1949a[1921]:22). Where he departs most clearly from Saussure is in the explicit appreciation of variety which grew out of the Amerindian imperative. (Notice, incidentally, that this imperative in and of itself was enough to determine a strong synchronic bent to American linguistics, since there was virtually no written records with which to plumb linguistic history; too, Boas—who, in any event, had little historical training—actively discouraged his students from comparativist work.) Sapir's work is remarkable for penetrating insights, brilliant leaps, and a careful balancing of the tension between the general properties of language and the astonishing range of concepts and categories employed by languages; between uniformity and diversity; between, in Varro's somewhat stilted terms, analogy and anomaly.

He writes eloquently about the "deep, controlling impulse to form" and "the great underlying ground-plans," and (in a phrase particularly evocative of Saussure) argues for "an ideal linguistic entity dominating the speech habits" of language users (1949a[1921]:144, 148). But he is equally eloquent, and more voluble, about variety, about the defining traits that keep speakers of different languages from truly understanding one another, even in translation, because each lacks "the necessary form-grooves in which to run" one another's thoughts (1949a[1921]:106).

Sapir's structuralism, then, was more thoroughly psychological than Saussure's, and it was—thanks to the wealth of native data that kept American linguists skeptical of general claims about language—much more aware of the diversity and volatility in the human trade of meanings. Sapir was ingenious, and very influential. But he was not, even though there were linguists sometimes known as *Sapirians* into the forties and fifties, the sort to sponsor a school; Joos (1957:25) cites him not for "the developing of any method, but rather the establishing of a charter for the free intellectual play of personalities more or less akin to his own," and, in fact, Joos wags his finger a bit at "the essential irresponsibility of what has been called Sapir's 'method'." Sapirians (almost entirely made up of Sapir's students) were distinguished mostly by their unorthodox interest in the mental life of language, for a certain methodological elasticism, and for their occasional critiques of the orthodoxy, not for a specific body of unique postulates and principles.

The same might have been said of Sapir's colleague at the University of Chicago, and his successor to the Sterling Professorship in Linguistics at Yale, and the definer of the orthodoxy in the forties and fifties, Leonard Bloomfield. The same might have been said of Bloomfield, but for two things. He found behaviorism and he

found logical positivism, for both of which he is now widely snickered at; behaviorism is an outmoded brand of psychology, positivism an outmoded brand of philosophy. So, Bloomfield's name shows up frequently as little more than a cipher in the linguistics of the last few decades, a foil to another name we have already seen a good deal of, and will see much more of, *Chomsky.* In part, the role of foil is natural, since understanding Chomsky's impact comes most easily when it is viewed as a reaction, if not a corrective, to certain Bloomfieldian trends. In part, the role of foil is imposed, since the victors write the history, and Chomsky's rise came at the expense of a generation inspired and strongly influenced by Bloomfield.

The word which best captures Bloomfield, especially in distinction to his partial rival, Sapir, is *methodical.* (Chomsky was never Bloomfield's rival except in the abstract; Bloomfield died before Chomsky came on the scene.) They both wrote books entitled *Language,* for instance, and the differences are telling. Sapir's (1949a[1921]) is a rich, invigorating essay—certainly not without structure and theoretical import, but heaped high with brilliant insights and imaginative leaps. Bloomfield's (1933) is a cookbook—certainly not without brilliance and imagination, but far more systematic, and far more careful about giving its readers recipes with which to obtain similar results, leading them to their own insights, guiding their imagination. The comparison may be less than flattering to Bloomfield, and it caricatures two books which hold up astonishingly well, despite more than sixty intervening years of feverish linguistic activity, but it catches the primary difference between the books, the linguists, and their respective impacts on the field. Sapir's book is more enjoyable, and perhaps more passionate, but it is also less practical, less useful. Bloomfield gave a generation of linguists a handbook. He gave them something to do (and, of course, many said, he made linguistics a science).[8] Even Sapir's most devout students had to admit Bloomfield's impact on the discipline was far more comprehensive:

> Although Sapir used linguistic methods and procedures with consummate skill, he was an artist rather than a scientist in this regard. It was Bloomfield who formulated the methods of linguistic science into a clearly defined and tightly coherent body of doctrine. (Newman, 1951:86)

Little more than a decade separates Bloomfield's *Language* from Sapir's, but it was an important one for American linguistics and goes almost as far toward explaining the differences between those two books as does the difference in their authors' temperaments. The defining event of that decade was the formation of the Linguistic Society of America, whose name proclaims the success of the independence movement early in the century and declares another one just under way; the modifiers on either side of *Society* say it all.[9] The prepositional phrase, *of America,* codifies the developments separating its members from their European relatives. The adjective, *Linguistic,* signals a separation from their academic relatives studying language in parallel disciplines. Appropriately, Boas, Sapir, and Bloomfield were all instrumental in forming the society: Boas and Sapir were the main forces in cutting the umbilical cord to Europe; Bloomfield was rapidly becoming the main force in cutting the apron strings to psychology and ethnology. He wrote the LSA's manifesto, calling for an organization distinct from "the existing societies, Philo-

logical, Oriental, Modern Language, Anthropological, Psychological, and what not," most of whose members "[do] not know that there is a science of language" (1925:1; 1970:109). Most people who called themselves *linguists* were in fact still housed in language or literature or anthropology departments—only three of the 264 Foundational Members of the LSA listed linguistics among the courses they taught—but they were beginning to feel more kinship with others who called themselves linguists than with their immediate colleagues, and Bloomfield articulated that kinship. Even linguists who maintained strong interests in literature or philology, for instance, took their papers in these areas to other forums. (Hill writes that he "felt forced to present" his literary analyses elsewhere—1991:14.)

The LSA soon fired up what has become a prominent feature of the field's landscape ever since, its summer Linguistic Institute. The Institute was (and remains) a very important training and indoctrination ground for scholars who saw themselves, or thereafter came to see themselves, as scientists of language first, scholars of culture or mind or French, second. Bloomfield was a regular and inspiring teacher at the Institute until his illness and death in the late forties (Sapir taught there only once). With the LSA also came a publishing organ—taking the common, omnivorous, but apropos title, *Language*—which soon became hugely influential to the profession and practice of linguistics, and no article was more influential in both regards than Bloomfield's contribution to the second issue, "A Set of Postulates for the Science of Language" (1926; 1970:128–40)—three decades later still being called "the Charter of contemporary descriptive linguistics" (Joos, 1957:31). The postulates take up a now-familiar topic, the object of linguistics (Saussure's *Course* and Sapir's *Language* are both cited as inspirations), but with considerably more rigor than they had been tackled by any of Bloomfield's predecessors. Here is a sample, kept mercifully brief:

> **8. Def.** A *minimum* X is an X which does not consist entirely of lesser X's.
> Thus, if X_1 consists of $X_2X_3X_4$, then X_1 is not a minimum X. But if X_1 consists of X_2X_3A, or of A_1A_2, or is unanalyzable, then X_1 is a minimum X.
>
> **9. Def.** A minimum form is a *morpheme;* its meaning a *sememe.*
> Thus a morpheme is a recurrent (meaningful) form which cannot in turn be analyzed into smaller recurrent (meaningful) forms. Hence any unanalyzable word or formative is a morpheme.
>
> **10. Def.** A form which may be an utterance is *free.* A form which is not free is *bound.*
> Thus, *book, the man* are free forms; *-ing* (as in *writing*), *-er* (as in *writer*) are bound forms, the last-named differing in meaning from the free form *err.*
>
> **11. Def.** A minimum free form is a *word.* (1926:155–56; 1970:130)

There are seventy-three more—fifty in all for synchronic linguistics, twenty-seven for diachronic linguistics (historical studies being still very much alive, but no longer in the driver's seat). All seventy-seven look equally pedantic. But only to someone unwilling to grant the need for precision in the study of language. They were necessary to give linguistics a formal backbone. Newton's *Opticks* may have looked pedantic to some of his contemporaries, Euclid's *Principles* to some of his;[10] certainly Bloomfield had such contemporaries. Sapir, for one. Sapir was no enemy of precision or of rigor, but his view of language was far too ramified for a neat

natural science approach, and he surely had Bloomfield in his mind, if not his sights, when he argued a few years later for a linguistics "which does not ape nor attempt to adopt unrevised the concepts of the natural sciences." Too, he was clearly worried about Bloomfieldian scissors at the apron strings when he followed that argument with a plea for linguists to "become increasingly concerned with the many anthropological, sociological, and psychological problems which invade the field of language" (1929:214), to no avail.[11] The strings were cut, at least far as the majority of linguists was concerned, especially the younger ones, who took the antiseptic postulates to heart and their fullest exposition, Bloomfield's *Language,* to bed with them at night.

Two collateral developments, outside the field of linguistics, in the *Language*-to-*Language* decade were even more important for Bloomfield's handbook, both apparently crystallizing for him at Ohio State, where he became fast friends with Albert Weiss (in fact, his postulates were explicitly modeled on Weiss' postulates for psychology—1925). These developments, foreshadowed a few pages back, were the rises of behaviorism and positivism, both of which reared their seductive heads in the twenties.

Behaviorist psychology had been building since Pavlov's famous Nobel-winning, ring-the-dinner-bell-and-watch-the-dog-drool experiments at the turn of the century, but it didn't hit its stride, or get its name, until the work of John Watson and his collaborators in the teens and twenties. In the baldest terms, behaviorism is the position that beliefs, actions, and knowledge are all the products of rewards and punishments. Give a pigeon food every time it sneezes, and it will soon start sneezing whenever it gets hungry. Shock a rat whenever it attacks another rat, and it will soon show less aggression. Smile at a baby and give her extra attention when she calls you "papa" and she will (though all too briefly) say "papa" whenever she wants some extra attention from you. Expose a child to censure or ridicule when she mispronounces "light" or gets an irregular plural wrong or spells a word incorrectly, and her linguistic behavior will converge on the norm; it will become grammatical. Behaviorism is a simple, powerful, compelling theory, especially for simple behavioral phenomena. Its attraction for Bloomfield was not so much that he could put it to work explaining linguistic behavior. Quite the opposite. It was so successful, he felt comfortable leaving the psychological ends of language to the psychologists.[12]

In short, it let him comfortably avoid the messier aspects of language—learning a language, knowing it, using it, understanding it—aspects that nagged earlier linguists, the pre-behaviorist Bloomfield included. His early writings show a concern for the mental tentacles of language, and a dependence on psychology ("linguistics is, of all the mental sciences, in need of guidance at every step by the best psychologic insight available"—1914:323). This concern dropped away, and Bloomfield became profoundly anti-mental. The psychology that entered his early work was pretty muddy stuff, sometimes tentatively offered, and his first text was criticized for it.[13] Far more important than this criticism, though, was that in the two decades between writing *An Introduction to the Study of Language* and what he called its "revised version" (but which everyone else called "a wholly new work"),[14] Bloomfield did serious field research on non-Indo-European languages (Tagalog, Menomini, Fox, Ojibwa, and Cree)—languages he couldn't study at leisure, under a

master at university, languages which didn't already have centuries of research on them. He bumped nose-to-pillar into the Amerindian imperative.[15] In the process, he came to view all the mental aspects of language as distractions from the real job, description: getting the phonological and morphological structure right. The relation of mental explanation to linguistic data was for him something like the relation "of the House of Lords to the House of Commons: when it agrees, superfluous; when it disagrees, obnoxious" (Hockett, 1965 [1964]:196).

His principal use of behaviorism, then, was as an appeal to justify cutting linguistics loose from the forbidding complexities of the mind. On this score, too, he took his lead from psychologists like Weiss, whom he praised for banishing "the specters of our tribal animism (mind, consciousness, will, and the like)" (1931:220; 1970:238). These psychologists, like Bloomfield, were motivated by the desire to be rigorous, and therefore scientific. Listen to George Miller's paraphrase of Watson and the early behaviorists:

> Look, introspection is unreliable, different people introspect differently, there's no way I can verify that you really had the experience you told me you had. Let's throw the mind out of psychology—that's all religious superstition. We'll be hard-headed, hard-nosed scientists. (in J. Miller, 1983:21)

With behaviorism you get the curious spectacle of a psychology that throws out the mental in order to talk exclusively about directly observable behavior; a psychology, in a very real sense, not of the mind, but of the body. Banishing everything not directly verifiable, for the behaviorists and for Bloomfield, was the way to be a science. They knew this because the logical positivists told them so.

Positivism has ancient roots, reaching back to the Epicureans and beyond, by way of the powerful British thinkers of the eighteenth century, Locke, Berkeley, and Hume; it is an articulation, somewhat extreme, of the grand philosophical tradition which says that all knowledge comes from the senses—empiricism. But its formal beginnings are with the famous *Wiener Kreiss* of twenties Vienna, a circle of thoroughly empiricist philosophers who took Wittgenstein's insufferably titled *Tractatus Logico-Philosophicus* (1961 [1921]) as their defining document. The short version of positivist thought, particularly as it relates to the enterprise that most concerned the circle, science, comes in the verification principle: The meaning of a proposition is the method of its verification. The meaning of "It's raining" is sticking your hand out the window; if it gets wet, the proposition is true; if not, not. The meaning of Galileo's law of descent is his ball-on-the-inclined-plane experiment, "repeated a full hundred times" and finding each time that "the times of descent, for various inclinations of the plane, bore to one another precisely the ratio" entailed by the law (1954 [1638]:179). The meaning of $E = mc^2$ is the apocalyptic detonation on 16 July 1945, in the New Mexico desert, repeated hundreds of times since. There is more than one method to skin a verification, of course—listen to the rain on the roof, look out the window, rub Fideau's head to see if it is wet as he comes through the doggy door—but the critical point for the positivists is that there be, in principle, *some* empirical method of verification. For Bloomfieldians, this method—called *mechanism*, in contrast to *mentalism*—was to link all explanations to the body. "The mechanist," Bloomfield told his followers, "believes that

mental images, feelings, and the like are merely popular terms for various bodily movements" (1933:142; Bloomfield's italics).

One of the important contributions of positivism (and empiricism generally) is its insistence on skepticism, and its consequent disavowal of subjects without even the most tenuous possibilities for verification. In particular, positivists continued the rejection of metaphysics begun in the previous century, condemning it as utter nonsense—not just in the informal sense of "silly," but, literally, without sense. Since Plato's Realm of the Forms, for instance, could be verified by no conceivable method, all statements about it were meaningless. The Vienna Circle refracted Wittgenstein's famous "Whereof one cannot speak, thereof one must be silent" (Wittgenstein, 1961 [1921]:150) into the slogan "Metaphysicians: Shut your traps!" The behaviorist and Bloomfieldian move from this slogan to "Mentalists: Shut your traps!" was a short drive. Not even that. A putt.[16]

So, mentalism in psychology and linguistics went the way of vitalism in biology, phlogiston in chemistry, ether in physics, and, also like those other notions, mentalism packed its bags when it left. One of its suitcases was particularly crucial for the discipline, however, the one into which mentalism threw a rather critical part of linguistics' subject matter, meaning. The Amerindian imperative had disposed linguists to concentrate on phonological and morphological description anyway, which kept their attention on the signifiers, away from the signifieds—away from the messier, harder-to-isolate-and-catalog aspects of language, away from meaning. But Bloomfield raised this reluctance from practice to principle. He was certainly well aware of the attractions meaning holds for linguists; if language was just some systematic noises humans made, with no connections to thought or society, it would be of no more interest than coughing, or sneezing, or playing the bagpipes. But he also recognized that linguistics' big successes (principally those of the comparativists) were much nearer the signifier shore of the gulf between sound and meaning; more pointedly, that "the statement of meaning is the weak point of language study" (1933:140).

His aversion of meaning involved some interesting sleight of discipline. One way to get on with the business at hand, Bloomfield held, was to establish your borders firmly on this side of messy data and recalcitrant issues, leaving them in someone else's backyard: "matters which form no real part of the subject should properly be disposed of by merely naming them as belonging to the domain of other sciences" (1926:154; 1970:129). Despite the peculiarity of saying that it formed no real part of language, meaning was one of those disposable matters for Bloomfield; he regularly suggested that it belonged more properly to psychology, sociology, anthropology, anything but linguistics. Linguistics had more immediate concerns, and in order to satisfy those concerns, he confessed of linguists, "we define the meaning of a linguistic form, wherever we can, in terms of some other science. Where this is impossible, we resort to makeshift devices" (1933:140). Bloomfield intended this statement as a description of the way things were generally done when linguists looked at languages, and it was, but for the generation of linguists which learned the field from his *Language,* it also became a prescription.[17]

There is an irony as big as Everest that positivism—a theory of meaning—undergirded the exclusion of meaning from linguistics, but Bloomfield, like most scien-

tists of the period who concerned themselves with philosophy, attended much more to the predicate of the verification principle than its subject, and one word was particularly eye-catching. The positivists cast metaphysics into the darkness by putting their spotlight brightly on the *method* of verification. The important thing about being a science was having a method; better yet, having a methodology. And the home-grown American structuralism that Bloomfield codified in his *Language* was nothing if not rigorously methodological.

Bloomfieldian methodology—and at this point we can safely start using his name as a descriptive adjective, the one which best characterizes American structuralism for, roughly, the three decades following publication of his text—was not, of course, strictly Bloomfield's.[18] It was a Saussurean-Sapirian mélange, strongly influenced by the practical necessities of analyzing the diverse, disappearing aboriginal languages of the Americas; mildly influenced by a few post-Saussurean European linguists; reworked, winnowed, and augmented by Bloomfield; and tied up with antimentalist, meaning-fearing ribbons. From Bloomfield's hands, it passed to several influential successors—most notably, Bernard Bloch, George Trager, Zellig Harris, and Charles Hockett—some of whom were considerably more dogmatic than their inspiring leader. The approach, in an epitome which does some violence to its flexibility, began with a large collection of recorded utterances from some language, a corpus. The corpus was subjected to a clear, stepwise, bottom-up strategy of analysis which began by breaking acoustic streams into discrete sounds, like the puff of air released when the lips are unsprung to form the first sound in *pin* or the stream of air forced through a channel formed by the tongue against the teeth as the last sound in *both.* These sounds were classified into various phonemes, each with a small range of acoustic realizations. Next were the small units like *per-* and *-vert,* classified into various morphemes, each with a small range of realizations. Next came words, classified into such categories as nouns and verbs, each with its realizations. Then there were utterances themselves—like *Oh my!* and *Where did I leave the dental floss?*—and further than that Bloomfieldians did not care to go. The enterprise surely seems dull and tedious to anyone who has not engaged in it, but it is a very demanding, intellectually challenging job to confront an alien stream of noises and uncover the structure in those noises that allows people to get one another to pass the pemmican.

American structuralism, in fact, was more diverse, and more interesting, than we really have time to appreciate here (see, for instance, Hymes and Fought, 1981 [1974]). There were several identifiable strains—including Sapir-tinged approaches to language, which did not outlaw mental considerations, and Christian approaches, which still studied languages primarily as means to missionary ends—along with a smattering of *indépendistes,* pluralists, and cranks. And they were a lively bunch, feuding among themselves, attacking their European counterparts, and pursuing cultural imperialism. But they were also quite cohesive, in methods and beliefs, the bulk of which followed from the theoretical structure erected by Bloomfield. His influence was everywhere, at first in person and through his textbook, then, increasingly, through his students and their students, especially by way of the LSA, its publishing arm, *Language,* and the Linguistic Institute.

Bloomfield's ideas defined the temper of the linguistic times: that it was primarily

a descriptive and taxonomic science, like zoology, geology, and astronomy; that mental speculations were tantamount to mysticism, an abandonment of science; that all the relevant psychological questions (learning, knowing, and using a language) would be answered by behaviorism; that meaning was outside the scope of scientific inquiry. This program was methodologically rigorous, and very successful.

There was a good deal of confidence and optimism in the air. Structuralism had proven so successful that linguistics was widely hailed as the most rigorous and fruitful knowledge-gathering activity outside the prototypical sciences, much as comparative linguistics had been hailed in the previous century. Sociologists, anthropologists, even folklorists were explicitly adopting its classificatory methods (the most famous of these adoptions being Levi-Strauss's structuralist anthropology), and the hybrid discipline of psycholinguistics was taking a few promising steps. Linguists had also proven their patriotic mettle during the Second World War (designing courses, writing books, and preparing audio materials to teach soldiers European, Pacific, and Asian languages; designing and analyzing secret codes; working as translators), and the field was therefore partaking in the postwar financial boom. Major projects were under way: language atlases of Canada and the U.S., an American English supplement to the great *Oxford English Dictionary,* and a project to document all the known languages of the world. There was even a popular radio show by one of the leading Bloomfieldian theorists, Henry Lee Smith's "Where Are You From?" With George Trager, Smith had also built a model with the promise of completeness, and the 1953 LSA Annual Meeting saw his extended paper on that model, "the fullest presentation ever made of the upward-looking technique [beginning with sound and moving 'upward' into morphemes and syntax]" (Hill, 1991:34). Linguists had reason to be a little smug.

The bad news amid all this promise, however, was the pronounced gaps in this work—the mind, meaning, thought; in short, the good stuff.

Lo, in the east, Chomsky arose.

Chomskyan Linguistics[19]

> I am interested in meaning and I would like to find a way to get at it.
>
> Noam Chomsky

Chomsky's rapid and radical success in restructuring linguistics—and this is one of those places in science where the unqualified use of the abused term, *revolution,* is wholly appropriate; Chomsky spun linguistics on its axis, if not its head—has almost everything to do with bringing the good stuff back into linguistics, and much of the generative-interpretive debate which flowed out of his revolution hinged on how much of the good stuff linguistics can handle, and in what ways, and still responsibly do its main job, accounting for the structure of language.

The good stuff came slowly, though. Chomsky was quite circumspect about mind and meaning in his early publications, offering his work in the conciliatory tones of measured expansion. There are two general ways scientists can present

innovative theoretical proposals to their field: as an extension of existing theory, the way Newton framed his optical proposals; or as a replacement of existing theory, the way Lavoisier framed his chemical proposals. Both are extremes, only partially connected to the distance between those innovations and the prevailing notions of the field, and Chomsky's proposals are best seen, like Newton's and Lavoisier's, as revisions—an extension here, a replacement there, a reinterpretation or a deletion somewhere else. But both are effective, and Chomsky has used both well, starting with the extension strategy.

Bloomfieldians had very little difficulty in seeing Chomsky's revisions as a methodological appendix to their concerns. For one thing, he was known to be the student of Zellig Harris, a brilliant, somewhat eccentric, but thoroughly Bloomfieldian, and very highly regarded linguist—"perhaps the most skillful and imaginative prophet [of the period]" (Bar-Hillel, 1967:537)—and Harris had developed a body of analyses and procedures from which Chomsky borrowed liberally. Harris, in fact, gave the 1955 LSA presidential address, "Transformation in Linguistic Structures," just as Chomsky was breaking onto the Bloomfieldian stage; Chomsky's first important paper, and a very Bloomfieldian one at that, was given the same year at the Georgetown Round Table on Linguistics. Chomsky's first important transformational book, *Syntactic Structures,* also coincided with an important Harris Paper, "Co-occurrence and Transformation in Linguistic Structure" (Chomsky, 1957a, Harris, 1957). The scene couldn't have been better set.

More importantly, though, among the most obvious lacunae in American linguistics of the period was one it had inherited from the neogrammarians, and they from the comparativists, a gaping hole in linguistic coverage which had been ignored since the Modistae and their Renaissance followers, a hole which Harris's research was trying to fill in. Syntax was AWOL.

The absence has many sources. In part, it was inertia. In part, it was Bloomfield's own confusing treatment of syntax; he had wrestled with it valiantly, but left his followers very little into which they could sink their methodical teeth. In part it was a reflection of Saussure's view, which saw the syntactic atom, the sentence, as "the typical unit of *parole*" (Wells, 1947a:15); that is, as outside the true subject matter of linguistics, *langue.* In part, it was the result of a methodological proscription which developed in Bloomfieldian linguistics against "mixing levels"—in effect, the insistence that a linguist first work out the sounds of a language (the level of phonology), then the words (the level of morphology), then the phrases and sentences (the level of syntax). Since the sounds and the words presented so many problems, it was tough to do the syntax justice.

But much of this absence also had to do with the primary data base. The dividing line between any two levels of linguistic analysis is not especially clear, and in many of the Amerindian languages that fueled Bloomfieldian research, the line between morphology and syntax is especially difficult to make out. Here is a standard delineation of the provinces of morphology and syntax, borrowed from an important Bloomfieldian text, Bloch and Trager's *Outline of Linguistic Analysis* (1942:53):[20]

> MORPHOLOGY deals with the structure of words; SYNTAX deals with the combinations of words into phrases and sentences.

Now how, in Manitou's name, is a linguist to apply these notions to an utterance like 1?

1 a:wlisautiss?arsiniarpuŋa

From an Eskimo dialect, this expression translates into English roughly as "I am looking for something suitable to use as a fishing line," but it is neither word, the province of morphology, nor sentence, the province of syntax; neither reptile nor mammal; or, rather, it is both, like a platypus, one webbed foot in the reptilian class, one in the mammalian. But the Bloomfieldians were in the position of biologists who are really good at fish and reptiles, but uncomfortable over milk secretion, fur, and warm-bloodedness, leaving them aside as problems for another day. They could get a long way applying their morphological tools to an utterance like 1, but consider one from a language closer to home:

2 A cat is on the mat.

This utterance is somewhat atypical, as the utterances of philosophers tend to be, but it is unambiguously a sentence, furry and warm-blooded, with an individual slot for everything, and everything in its slot. There are six little words, each pretty much on its own, morphologically speaking. In concert, the words comprise an assertion about the world, and smaller groups of these words form components of the assertion—*a* and *cat* go naturally together, in the same way that *the* and *mat* go together; *is* and *on* don't go naturally together (*a cat,* for instance, can be used to answer a question like "What is sitting on the mat?" but *is on* would only be uttered in very unusual circumstances). In short, the English sentence is full of plums for the syntactic picking, ripe and inviting. The Eskimo sentence, while not immune to syntactic analysis, yields much more revealing fruits to morphological harvesters.[21]

The Bloomfieldians, once they had their morphological crop, usually left the orchard, and therefore had almost nothing of interest to say about linguistic clusters the size of phrases and sentences. It's not that the Bloomfieldians ignored syntax, or, with meaning, defined it as outside the scope of linguistics. Bloomfieldian linguistics was said to concern three core topics—phonology, morphology, and syntax—none of which was ever left out of a textbook, and none of which was ever ignored in the Bloomfieldian mainstay, fieldwork. When linguists wrote textbooks or overviews, there was always a chapter on syntax. When they went out to bag a language, their descriptive grammars always dutifully included a chapter or two on syntax (usually called *grammar*). But such chapters often betray an informality that was anathema to the Bloomfieldian program. The phonological and morphological analyses were rich, detailed, revealing investigations; the methodologies were probing. Syntactic analyses were haphazard, seat-of-the-pants outlines, and contained far more discussion of phenomena linguists would now call morphological than they would call syntactic; the methodologies were limp extensions of slice-and-dice, sounds-and-words procedures.

What was missing was method, and since method was the defining notion of science for Bloomfield, syntactic work usually came with an air of embarrassment. Charles Fries begins his *American English Grammar* with a preface apologizing to

those readers "who are well trained in the scientific approach to language" (1940:viii) for the casualness of his treatment. Trager and Smith, not known for humility, note only that "syntax, as yet only begun (as will become evident) is necessarily treated sketchily" (1957 [1951]:8). Trager and Smith's syntactic program—and it *was* a program, going by the suitably sound-based label, phonological syntax—was in fact widely considered to be the most promising approach in the Bloomfieldian tool shed.

In brief, American structuralists' results in syntax are dwarfed by their advances in phonology and morphology, and not even in the same league with Chomsky's first book, *Syntactic Structures,* let alone such post-Chomskyan works as McCawley's (1988) masterful two-volume *Syntactic Phenomena of English.*[22]

Still, syntactic poverty didn't cause too much anxiety. The Bloomfieldian universe was unfolding as it should, and the gap would be filled in due course, once the final intricacies of sounds and words had been worked out. Hockett (1987:81) calls the ten or so years after Bloomfield's *Language,* "the Decade of the Phoneme;" the ten years after that, "the Decade of the Morpheme," and there was reason to believe the Decade of the Sentence was impending. Indeed, Bloomfieldian successes with sounds and words were so impressive that there was a kind of gloomy optimism in the air, at least in Pennsylvania, where Chomsky was working under Harris. As Chomsky recalls,

> In the late 1940s, Harris, like most structural linguists, had concluded that the field was essentially finished, that linguistics was finished. They had already done everything. They had solved all the problems. You maybe had to dot a couple of i's or something, but essentially the field was over. (See Chomsky 1991a [1989]:11 for similar comments.)

The finished-field theme is a common one in the story of scientific shake-ups, signaling the calm before the storm, and Chomsky's story could easily be Max Planck's:

> When he was seventeen years old and ready to enter the university, Planck sought out the head of the physics department and told the professor of his ambition. The response was not encouraging: "Physics is a branch of knowledge that is just about complete," the professor said drearily. "The important discoveries, all of them, have been made. It is hardly worth entering physics anymore." (Cline, 1987:34).[23]

Planck went on to discover his famous constant, the spark that ignited the quantum revolution. Harris developed the transformation, the spark that set Chomsky alight. And, just as Planck was working conscientiously to elaborate the Newtonian paradigm, Harris was working to expand the Bloomfieldian paradigm. He set out to find methods for boiling down syntax to a set of patterns small enough and consistent enough that structuralist methods could go to work on them, and he imported a concept from mathematics to get him there, the transformation. Some Bloomfieldians may have found Harris's work in syntax a little premature, but still a palatable extension of structuralism, and he was not the only theorist beginning to scratch around in syntax. Younger linguists, in particular, found the prospect of syntax inviting; indeed, inevitable. The previous generation had conquered pho-

nology and morphology. The next domain for conquest in the inexorable march toward meaning was syntax, and some small incursions had been made by the early fifties. In particular, an approach called *Immediate Constituent analysis* was generating a fair amount of attention.[24]

Chomsky's approach to syntax has two critical components, both signalled by the most common term for his program, *transformational-generative grammar.* The most wide-reaching of his innovations is in the second half of the compound. A generative grammar is a formal mechanism which generates structural descriptions of the sentences in a language, in the mathematical sense of *generate.* A generative grammar is a collection of rules which define the sounds, words, phrases, and sentences of a language in the same way that geometry is a collection of rules which define circles and squares. And the point of both systems is also the same—geometry represents knowledge about space; generative grammar represents knowledge about language—which is where the transformation comes in.

There are strong empirical constraints in both domains. Certain concepts are necessary to model knowledge of space, and certain concepts are necessary to model knowledge of language. One of these concepts, from Chomsky's perspective, is given in the first half of the compound: Harris's structure-relating device, the transformation. Again, the analogy with mathematics is important, where a wealth of procedures exists for transforming data structures into other data structures, coordinates into shapes, circles into spheres. In fact, Klein has said "geometry is not really about points, lines, angles and parallels; it is about transformations" (Stewart, 1990:31). In linguistics, the transformation adds, deletes, and permutes—for instance, transforming the a-sentences below into the b-sentences.

3 a A mat is on the cat.
  b There is a mat on the cat.

4 a Aardvarks like ants, and they like Guinness too.
  b Aardvarks like ants, and Guinness too.

5 a Floyd broke the glass.
  b The glass was broken by Floyd.

Harris wanted the transformation to help tame syntactic diversity. It was a tool, plain and simple, with no particular implications for the general Bloomfieldian program beyond a welcome increase in scope, bringing order to the third, and highest, level of linguistic analysis. What Chomsky wanted the transformation for isn't at all clear in his earliest writings, but his brilliant first book, *Syntactic Structures,* leaves the impression that he is carrying out his mentor's Bloomfieldian intentions. Right at the outset, Chomsky says

> During the entire period of this research I have had the benefit of very frequent and lengthy conversations with Zellig S. Harris. So many of his ideas and suggestions are incorporated into the text below and in the research on which it is based that I will make no attempt to indicate them by special reference. (1957a:6)

Chomsky followed this acknowledgment with the observation that "Harris' work on transformational structure . . . proceeds from a somewhat different point of

view" than his own, and there are some hints in the book that the differences might run fairly deep. But "somewhat different point of view" is mild, and most linguists took *Syntactic Structures*—a lucid, engaging, persuasive argument that transformations are the most promising syntactic tool—largely as a popularization of Harris's theories. (Harris can be a very forbidding author.)

Chomsky's contributions were recognized as far-ranging, even renovating, for Bloomfieldian linguistics—one review called the goals of *Syntactic Structures* "Copernican" in scope (Voegelin, 1958:229), and Bloch was "convinced that transformational theory (or whatever you want to call it) is a tremendously important advance in grammatical thinking"[25]—but not threatening. Yet, in a few short years, *linguistics* effectively wore a new name-cum-adjective, *Chomskyan,* and the dispossessed Bloomfieldians were vehemently denouncing this "perversion of science," this "Anglicizing straitjacket," this "theory spawned by a nest of vipers." "Let's stop being polite," one Bloomfieldian implored the flagging troops, "reject any concession to the heresy, and get back to linguistics as a science, an anthropological science."[26]

They did stop being polite (in fact, somewhat before the exhortation), but it was too late. The heresy had become orthodoxy.

But—sponsored by Harris, nurtured by Bloch, adopted by Householder—how did it become heresy in the first place? The simple answer, and the fullest one, is that Chomsky changed his rhetorical stance to the holy Bloomfieldian church from extension to rejection and replacement. He was no longer just taking American linguistics boldly into syntax, where it had once feared to tread, or had trod very timidly; he was systematically dismantling the Bloomfieldian program and erecting his own in its place. One by one, he attacked the foundations of recent American linguistics: behaviorism, positivism, and the descriptive mandate. One by one, he attacked the cornerstones of its specific theories: not just its Immediate Constituent syntax, but also its phonology, its morphology, and its very conception of language. Some of his opposition to the architecture of Bloomfieldianism was implicit in *Syntactic Structures*—a generative theory, after all, is a theory of knowledge; a theory of mind; a theory of mental structure—but many developed, or were revealed, after the first flushes of success that followed its publication.

Those flushes, as flushes are wont to do, came among the young, "especially," in Bloch's estimation, with "the most brilliant among them" (Murray, 1980:79). They found Chomsky electromagnetic and the older linguists lost their heirs to the heresy. Younger linguists deserted the Bloomfieldian mainstays—sounds, words, and the description of indigenous languages—to work on syntax, even on semantics, and to plunge deeply into one language, rather than looking broadly at many. The classic example is Paul Postal, who did his doctoral research on Mohawk in the Bloomfieldian citadel of Yale, but did it with a growing unease:

> In the back of my mind had been this sense of strangeness. I guess I was pretty unhappy about what passed for linguistics, but I had no sense of why, or what was wrong, or what counted as an alternative. It seemed to me that it was probably based on some wrong assumptions, but I couldn't put my finger on them.

When Chomsky put *his* finger on certain issues, though, "it seemed exactly right."

> The general views [Bloomfieldians held] were very primitive and silly—ideas involving rigorous collection of data and cataloging, and all that kind of stuff. They took this to be science, very genuinely and kind of sadly. And, as far as one could see, this had no connection with what modern science was like.

Chomsky's conception of science, which was closely in tune with contemporary philosophy of science (now invoking positivism almost exclusively as a whipping boy), was one of the most attractive features of his program. The promise of getting at meaning was another. The promise of getting at mind was another. The brew was intoxicating, and customers were lining the bar.