JOSEPH HAROLD GREENBERG

Joseph H. Greenberg, one of the most original and influential linguists of the twentieth century, died at his home in Stanford, California, on May 7th, 2001, three weeks before his eighty-sixth birthday.[1] Greenberg was a major pioneer in the development of linguistics as an empirical science. His work was always founded directly on quantitative data from a single language or from a wide range of languages. His chief legacy to contemporary linguistics is in the development of an approach to the study of language—typology and univerals—and to historical linguistics. Yet he also made major contributions to sociolinguistics, psycholinguistics, phonetics and phonology, morphology, and especially African language studies.

Joe Greenberg was born on May 28th, 1915, in Brooklyn, New York, the second of two children. His father was a Polish Jew and his mother, a German Jew. His father's family name was originally Zyto, but in one of those turn-of-the-century immigrant stories, he ended up taking the name of his landlord. Joe Greenberg's early loves were music and languages. As a child he sat fascinated next to his mother while she played the piano, and he asked her to teach him. She taught him musical notation and then found him a local teacher. Greenberg ended up studying with a Madame Vangerova, associated with the Curtis Institute. Greenberg even gave a concert at Steinway Hall at the age of fourteen, and won a citywide prize for best chamber music ensemble. But after finishing high school, Greenberg chose an academic career instead of a musical one, although he continued to play the piano every evening until near the end of his life.

Greenberg's fascination with languages began equally early. He went to Hebrew school, which offered only an elementary education in Hebrew, essentially how to read the script. But Greenberg got hold of a Hebrew grammar and taught himself the language. He studied Latin and German at James Madison High School. He had a friend at the Erasmus High School who studied Classical Greek, but James Madison High School didn't offer Greek. He learned as much Greek as he could from a parallel-text edition of Sophocles's plays and the etymologies of the Oxford dictionary, and asked his father if he could transfer to Erasmus High School. They went to see the principal, who asked Joe why he wanted to study Greek, Joe simply said 'I'd like to study Greek', and the principal refused his transfer. On the way home Joe cried and his father took him into town and bought him a Greek grammar and dictionary from a used-book store. So he taught himself Greek—in fact, that was the usual way he learned languages.

When Greenberg began college at Columbia in 1932, he continued Latin and Greek and taught himself Classical Arabic. He also signed up for classes in obscure languages such as Akkadian and various Slavic languages, annoying professors who thought they could get away without teaching by offering classes they thought nobody would take.

[1] I would like to thank Paul Newman, Merritt Ruhlen, and Selma Greenberg for their help in preparing this obituary, and John Rawlings of Stanford University Library for making available to me a transcript of two interviews he conducted with Greenberg in March 2001. And of course my greatest thanks are to Joe Greenberg himself, for sharing the unpublished reminiscences and thoughts reported here, and above all for my education in linguistics.

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Joe discovered comparative linguistics in his junior year and anthropology in his senior year. In his senior year he also audited a class given by Boas on American Indian languages, and on his own read all the Native American language grammars in Boas 1911, 1922. Because of his Classical and Semitic background, Greenberg entertained the idea of becoming a medieval historian specializing in contacts between Christianity and Islam in Africa. But opportunities in the humanities in the Depression were nonexistent, and his anthropology professor, Alexander Lesser, suggested he apply for a Social Science Research Council Ph.D. grant to study under Melville Herskovits, a major Africanist at Northwestern University, and obtained references for him from Boas and Ruth Benedict. Greenberg received the grant and studied with Herskovits at Northwestern. In his third year he did fieldwork among the Hausa in Nigeria (learning Hausa in the process), and wrote a dissertation on the influence of Islam on one of the few remaining non-Islamic Hausa groups.

Greenberg's intellectual interests continued to expand. Herskovits encouraged him to spend his second year at Yale (1937–38), where he studied with the anthropologists Spier and Lowie and the linguists Bloomfield, Sturtevant, and Edgerton. The linguistics courses were all comparative Indo-European, but Bloomfield suggested that he read Carnap and thereby introduced Greenberg to logical positivism. Greenberg studied Whitehead and Russell's *Principia Mathematica*, even taking it with him when he was drafted into the Army in 1940. Logical positivism had a significant influence on Greenberg, not only in the general rigor of its argumentation; he published axiomatizations of kinship systems (1949a) and phonology (1959). But it wasn't until he returned to Yale with a postdoctoral fellowship that he made his acquaintance with American structuralism, auditing courses with Bloch, Trager, and Whorf. (He never met Sapir, who was ill at the time.)

Greenberg took the postdoctoral position because there were no academic positions in the Depression, especially for Jews. Being drafted into the Army in 1940 solved the employment problem for five years. Before he left for the war, he married Selma Berkowitz, whom he had met when she was finishing high school and he was starting at Columbia; she remained his companion and support for the rest of his life. Greenberg entered the Army Signal Corps and was eventually sent to North Africa, participating in the landing at Casablanca. In North Africa, he and his colleagues got up in the middle of the night and had deciphered the German or Italian code by the early morning. After the Allied invasion of Italy, he was sent to Italy, where he remained until the end of the war—and learned Italian, of course.

Conditions for academic employment were completely different after World War II than during the Depression. The GI Bill offered funding for GIs to go to college, and universities expanded. The expansion continued as the postwar baby boom eventually made its way to college. Greenberg was appointed at the University of Minnesota in 1946 and moved to the anthropology department at Columbia University in 1948. Jakobson and Martinet had arrived from Europe and had founded the Linguistic Circle of New York. Through them, Greenberg was exposed to the structuralism of the Prague school, including Trubetzkoy's work on markedness. (He also coedited *Word* from 1950 to 1954.)

Thus, Greenberg's intellectual roots included all of the major strands of linguistics, philosophy and anthropology at the time: American structuralism, Prague school structuralism, comparative historical linguistics, logical positivism, and cultural anthropology. (Not to mention his Classical and Semitic background, or his awesomely broad reading, which continued to the end of his life.) At the time, the first linguistics depart-

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ments in America were being established, and Greenberg was in a position to help shape the field. Linguistics was still largely divided among philologists working on historical linguistics and anthropological field linguists working on 'exotic' languages. Linguistics was still in the process of declaring its academic and intellectual independence from philology and anthropology. Greenberg made major contributions to the independent establishment of linguistics as a field and as a science.

Greenberg's first major work was the genetic classification of the languages of Africa, published in serialized form in the Southwestern Journal of Anthropology in 1949–50. At the time, African languages were classified into five families: Semitic, Hamitic, Sudanic, Bantu, and Bushman (Newman 1995:3). Greenberg classified them instead into sixteen families, based on two fundamental principles. The first, enunciated in the first article in the series (Greenberg 1949:79–83), is the exclusion of typological features from genetic classification. That is, properties purely of form—phonological patterns or grammatical patterns—or of meaning—semantic patterns—are too likely to diffuse, too small in number, and too likely to result from independent convergence to act as indicators of genetic descent. Instead, the arbitrary pairings of form and meaning, in both morphology and lexicon, provide the best evidence for genetic classification. This separation of typological and genetic traits of languages provided the key to genetic classification, and almost as a byproduct produced the independent development of typology a few years later in Greenberg's career.

The second principle is the exclusion of nonlinguistic evidence from the establishment of linguistic genetic families (Greenberg 1950a:57–58). Both of these principles were violated by the accepted classification of African languages. Typological traits such as the presence or absence of sex gender and nonlinguistic factors such as race played a role in the accepted classification. Greenberg's classification cut across the accepted classification but established the basic principles for genetic classification of languages. As a young American scholar, he upset the senior British and German scholars in the field, and a heated debate ensued.

Greenberg did not stop at African language classification. He turned to the study of the languages of the Americas, Australia, and other parts of the world. While North American languages were at the time grouped into a small number of large families, South American languages were not, and so Greenberg began with South America, where he identified seven families. In Australia, he identified one widespread family, which he called General Australian (identical to Pama-Nyungan), and a large number of small families. Some of these observations were published in Greenberg 1953. In response to criticisms of that paper and his other work, Greenberg explicitly formulated the third and final principle of genetic classification, namely the simultaneous comparison of the full range of languages and forms for the area under study (Greenberg 1954a:406–8). In 1955, Greenberg's African classification was reprinted, and he had consolidated the sixteen families to twelve. He continued his classification work, proposing fourteen families for the non-Austronesian, non-Australian languages in Oceania in a report to the Wenner-Gren Foundation in 1958.

Greenberg himself, however, did not fully realize the ramifications of his method until, as he described it later, 'one day, probably in early 1959, as I put my foot on the pavement to cross Amsterdam Avenue on my way to Columbia, an idea flashed before me. Why shouldn't I just look at all of my then twelve families in Africa together?' ([233]:147).[2] He did so: the final classification (Greenberg 1963) has four

[2] References in square brackets are to items in the supplemental bibliography (1988 to the present) given as an appendix to this obituary.

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families: Afroasiatic, Khoisan, Niger-Kordofanian, and Nilo-Saharan. This classification has been broadly accepted.

In 1960 Greenberg presented evidence that the fourteen families he identified in Oceania belong to a single group. In the same year, a paper originally presented in 1956 was published, proposing that the Native American languages fall into three genetic groupings. (Sydney Lamb and Morris Swadesh independently arrived at the same conclusion at about the same time; [207]:6.) In the course of his research on the Native American languages, he compared them with languages in northern Eurasia and by the early 1960s had identified another large family ranging from Indo-European in the west to Eskimo-Aleut in the east ([245]:5). But Greenberg did not publish the evidence for these proposals until many years later, and for this reason I will return to the 1950s to take up the other strands of Greenberg's contributions to linguistics.

Much of Greenberg's earlier work is on African linguistics, and he was recognized early on as one of the leading African language scholars. In addition to the classification of African languages, he wrote numerous articles on phonology and morphology, particularly in Afroasiatic, and on language contact in Africa. In 'The patterning of root morphemes in Semitic' (Greenberg 1950b), Greenberg displayed his characteristic approach to a linguistic problem. He examined 3775 Arabic triliteral roots and surveyed roots in other Semitic languages in order to formulate a number of constraints on the occurrence of phonemes and phonological features across the root consonants of Semitic. The article also displays his breadth of knowledge of the literature and citation of antecedents and parallel discovery. It is a pathbreaking work, one that has been repeatedly cited in later research on morpheme structure conditions and phonotactic constraints (see e.g. Frisch & Zawaydeh 2001).

Nevertheless, Greenberg described himself as being in a state of intellectual ferment, or even crisis, in 1952 to 1954 ([225]:23). Although not formally trained as a linguist, he had been influenced by American structuralism and its seeming philosophical counterpart, logical postivism. Yet he had recognized some of structuralism's weaknesses, partly through influences such as the Prague School and comparative-historical linguistics (which had much greater prestige then than now). In particular, he questioned American structuralism's lack of interest in meaning and use, the strict separation of synchrony and diachrony, and the methods for uncovering basic linguistic units such as the phoneme.

Greenberg recalled another formative experience that occurred in 1953. He was part of an interdisciplinary seminar on linguistics and psychology organized by the Social Science Research Council. He presented the current state of linguistics, that is, the rigorous methodology of American structuralism, about which he already had misgivings.

> When I had finished, Cornelius Osgood, one of the psychologist members of the seminar, asked me a question which was to haunt me thenceforth and helped determine the direction of much of my future work. I cannot now recall his exact words, but they were approximately the following. "You have described a very impressive procedure for analyzing any language into its basic units. However, if you could tell me something that was true about all languages, that would be of interest to psychologists."
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> It was this remark that brought home to me the realization that all of contemporary American linguistics consisted of elaborate but essentially descriptive procedures. (Greenberg 1986:13–14)

It would be four more years, however, before Greenberg published his first paper on language universals. Instead, his next major publication in synchronic theory was in the area of typology (Greenberg 1954b). At that time, typology was the study of language differences, not similarities, based on phonological and morphological traits.

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The morphological typology of the nineteenth century, dividing languages into isolating, agglutinative and inflectional types, was the only major typological classification of languages until Trubetzkoy's work on phonological systems. The morphological typology had been refined and elaborated by Edward Sapir (1921)—always Joe's linguistic hero. Greenberg's essay was a refinement and quantification of Sapir's typology, accompanied by an insightful analysis of the fundamental segmentation of utterances into words and morphemes.

But Greenberg's interest was chiefly in universals. In 1954, he also published a paper on linguistic relativity (Greenberg 1954c), in which he expressed skepticism about relativistic claims. (He told me that the editor of the volume invited him, expecting to receive an article supporting relativity, and received instead a rather unexpected contribution.) In 1957 Greenberg published his first work on language universals, the last essay in his volume *Essays in linguistics* (Greenberg 1957a). The other essays in the volume are two on the units of language, including his analysis of morpheme and word; two now classic articles on language classification and subgrouping; two on evolution, diffusion and migration; and one on the relationship between structure and function. The volume was widely read and remains well worth reading today.

The final essay (Greenberg 1957b) is in 'general linguistics' and contained the germs of Greenberg's future work on language universals. Greenberg establishes the basic principles that universals must represent generalizations over historically independent cases of the phenomenon to be studied (1957b:88), and makes the first link between typology as practiced then and language universals. It is this link that represents Greenberg's great insight into the study of grammar. He notes that there are very few unrestricted universals, of the form 'All languages have X', and those that exist are not terribly interesting. Instead, the search for universals must focus on the distribution of types found in languages, such as the preference for suffixing over prefixing, and the correlation between different typological features across languages, such as the correlation between preposition-noun order and noun-genitive order (1957b:86–87). That is, significant universals are to be found in constraints on crosslinguistic variation, not in crosslinguistic uniformity. Greenberg also asserts that such universals 'require some explanation, one which inevitably takes into account functional, psychological and social factors underlying all language behavior' (1957b:86)—an early statement of what has come to be called the functionalist approach to language.

The essay itself examines the suffixing preference and offers a psychological explanation for it. The following year (1958–59), Greenberg was invited as a fellow to the Center for the Advanced Study in the Behavioral Sciences at Stanford, along with Osgood and James Jenkins, the psychologists with whom he collaborated. It was an exciting year at the Center: next door to Greenberg, Thomas Kuhn was writing *The structure of scientific revolutions*, and Quine was writing *Word and object*. Greenberg himself was working on language universals and planning a conference with Osgood and Jenkins, which was held at Dobbs Ferry in 1961.

At the Dobbs Ferry conference, Greenberg first presented what became his most famous and far-reaching contribution to linguistics: 'Some universals of grammar with particular reference to the order of meaningful elements'. The same paper was presented in the following year at the Ninth International Congress of Linguists at MIT (where Noam Chomsky also presented his ideas to an international audience for the first time), and then published in 1963 along with the other Dobbs Ferry papers (Greenberg 1963/1966). This paper remains one of the most widely cited papers in linguistics.

In this paper, Greenberg went beyond his 1957b essay to represent universals in

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logical form, namely as implicational universals ('if a language has X, then it also has Y') and biconditional universals ('a language has X if and only if it also has Y'). He constructed an areally and genetically diverse sample of thirty languages in order to infer empirically valid universals (1963/1966:74–75), arguing that grammatical categories must be compared across languages on an ultimately external, semantic basis (74). He then applied this method to word order and morphological categories, constructing a total of forty-five universals. In the concluding section, Greenberg offers more general principles to account for the word order universals. In particular, he posits two general word-order principles, DOMINANCE (a preference for one order over its opposite, e.g. demonstrative-noun over noun-demonstrative) and HARMONY (an association between one word order and a second word order, e.g. adjective-noun is harmonic with demonstrative-noun), and posits a principle governing their interaction: 'A dominant order may always occur, but its opposite, the recessive, occurs only when a harmonic construction is likewise present' (1963/1966:97). The latter principle is an early example of a competing motivations explanation of language universals. In other words, Greenberg's paper established the basic methodology of what is now known as the typological approach to grammar, derived major empirical results, and offered a type of explanation used widely today in typological analyses.

The impact of Greenberg's paper was dramatic. At the time, the field of linguistics was also being challenged by Noam Chomsky. Chomsky was arguing that linguistics should focus its attention on syntax, rather than just phonology and morphology as had the American and European structuralists up to that time. Chomsky also argued that linguists should seek language universals, and contrary to the beliefs of many American structuralists, that there are significant language universals to be discovered. Chomsky sought language universals through deductive reasoning in the analysis of individual languages into their 'deep structure' and transformations of that deep structure into surface structure. But at the same time, Greenberg produced a large number of substantive universals of syntax, derived via inductive empirical generalization over 'surface' structure across a wide range of languages. Some of Chomsky's disciples immediately incorporated word-order typology (e.g. McCawley 1970). But the fact remains that Chomsky and Greenberg at about the same time proposed opposing theories about universals of grammar (particularly syntax), how they are to be defined and discovered, and how they are to be explained. These later became known as the Chomskyan and Greenbergian approaches to language universals, and later characterized more broadly as the formalist and functionalist approaches to language (though in fact the latter labels encompass a broader range of theories than their historical founders would accept, and embrace theories that precede both of them).

During the 1960s, however, despite the great interest in his word-order universals, Greenberg worked largely alone. This was partly due to institutional arrangements. In 1962, Greenberg moved to the department of anthropology at Stanford University. Stanford had only a committee on linguistics at the time, and as a result Greenberg had very few graduate students. Greenberg was instrumental in establishing a department of linguistics at Stanford in 1973. In 1967, Greenberg and his colleague Charles Ferguson received a National Science Foundation Grant for research into language universals that lasted until 1976. Greenberg and Ferguson were able to fund research by many postdoctoral fellows, including major figures in the next generation of typologists, such as Talmy Givón, Leonard Talmy, and Edith Moravcsik. The result of this project was a series of twenty Working Papers in Language Universals and the four-volume *Universals of human language* (Greenberg et al. 1978).

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Greenberg himself produced a number of important studies of language universals during this time, on consonant clusters (1964/1978), an oft-cited study of glottalic consonants (1970), word prosodic systems (Greenberg & Kashube 1976), and numeral systems (1974a, 1978a), not to mention numerous general essays on typology and universals, the broadest of which is Greenberg 1974b. The most influential synchronic study after his word-order research is his article on universals of markedness and markedness hierarchies (1966a). Markedness was of course an idea developed by the Prague school theorists, whose work Greenberg was exposed to in his early years teaching at Columbia. In Prague school theory, however, markedness is a property of language-specific grammatical categories, and the markedness of a category such as 'singular' can vary from language to language. Greenberg reinterpreted markedness as a property of crosslinguistic categories, that is, conceptual categories, so that for instance it is a universal that the singular is unmarked compared to the plural. Greenberg constructed a series of universals of formal expression based on markedness relations, and also argued that the morphological (though not phonological) universals are ultimately explainable in terms of text frequency. Again, Greenberg's work anticipates later developments in functionalist linguistic theory, now usually described as the usage-based model (see for example Bybee 1985, Barlow & Kemmer 2000, Bybee & Hopper 2001).

Greenberg's own theoretical interests took a new turn in the 1960s. He began to explore diachronic typology, that is, universals of language change as well as universals of synchronic language structure. In fact, Greenberg's interest in this topic is displayed as early as his first publication on language universals, in which he notes that prefixing languages may develop infixes whereas suffixing languages may develop root-internal changes, both as the result of the psychological preference of anticipation over perseveration (Greenberg 1957b:92–93). Greenberg was no doubt also inspired by his extensive comparative-historical research in Africa and in other parts of the world.

Greenberg realized that the constraints on patterns of crosslinguistic variation are ultimately constraints on paths of change of language, and so synchronic typology can, and should, be reanalyzed as diachronic typology. He began this reinterpretation of synchronic typology in a short paper on phonological universals in this journal (1966b). His first full statement of diachronic typology was published in 1969 as 'Some methods of dynamic comparison in linguistics'. His other major statement of diachronic typological theory is 'Diachrony, synchrony and language universals' (1978b). In these papers, he demonstrates how synchronic typologies can be reinterpreted as diachronic ones, how comparative-historical studies can be used to develop hypotheses of universals of language change, and proposes a model for the representation of diachronic patterns (the state-process model). Greenberg's diachronic approach to language is presented more generally in his LSA presidential address of 1977, 'Rethinking linguistics diachronically' (Greenberg 1979).

In the 1969 paper, Greenberg also presents case studies of universals of language change. In addition to these examples, he also began publishing major papers on diachronic typology, on numeral constructions (1972/1977, 1975, [200]), gender markers (1978c, 1981), word order (1980), and pronouns (1988, [222], [246]). Of these, the study on gender markers helped to stimulate the tremendous explosion of research on grammaticalization, which is the chief area of research in diachronic typology today. Greenberg compares the gender markers in the Niger-Kordofanian languages and identifies a grammaticalization process by which a demonstrative such as 'that' evolves to a definite (stage 1) article, then to a stage 2 article covering both definite and specific indefinite functions, and finally to a stage 3 article found on nouns in virtually all

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contexts, by which time it is reinterpreted as a noun class/gender marker. In a 1991 paper ([215]) Greenberg proposes a further process, regrammaticalization, by which a highly grammaticalized marker is employed in other grammatical functions, for example a noun marker is employed as a verbal nominalizer. This process is identical to Lass's independently proposed mechanism of exaptation (Lass 1990).

It is now de rigueur for typological studies to examine diachronic as well as synchronic universals (Lehmann 1984, Bybee, et al. 1994, Haspelmath 1997, Stassen 1997). Although there is now much discussion of emergence in grammar and of the dynamic usage-based model in the functional-typological approach, the consequences of Greenberg's rethinking linguistics diachronically have yet to have their full impact in the intellectual development of linguistics.

From the beginning of his research on language universals to the end of his life, Greenberg argued that a prerequisite for typological research, synchronic as well as diachronic, is the establishment of the genetic classification of languages:

> Since for the purposes of the latter [the discovery of language universals], a single case is a single historically connected instance, progress is dependent on the solution of historic[al] problems whose results thus enter integrally into comparative studies (Greenberg 1957b:88)
>
> [G]rammatical comparison of related forms in stocks of chronological depth provides rich material for diachronic typological study, both of the earlier stages of grammaticalization and of the later stages of the history of categories. Here typological and genetic studies are mutually fruitful ([245]:vii)

Greenberg's interest in the topic of language classification did not cease during the 1960s and 1970s, when most of his attention was focused on typology and universals. However, he did not begin to publish the results of this research until later in his life.

The first new publication on language classification outside Africa was 'The Indo-Pacific hypothesis' (Greenberg 1971a). Between 1960 and 1970, Greenberg gathered all of the material then published on Indo-Pacific languages, and was able to examine some unpublished data as well. He organized the data in twelve notebooks of 60–80 languages each, with up to 350 lexical entries for each language, and also made detailed grammatical comparisons in three further notebooks. To check against the possibility of borrowing from Austronesian, Greenberg prepared vocabularies of similar length for 50 Austronesian languages, particularly those in proximity to Indo-Pacific languages. Both lexical and grammatical evidence were presented, as with the African classification. Indo-Pacific contains the fourteen subgroups originally identified in 1958, which were further divided into subsubgroups. There were a handful of small groups and isolates that Greenberg identified as Indo-Pacific, but was not able to assign to specific subgroups. The article concluded with proposals for the internal grouping of the fourteen subgroups.

Greenberg's Indo-Pacific hypothesis met a different fate from his African hypothesis, which had become accepted by this time. After initial reactions, some positive and others negative, Greenberg's hypothesis was basically ignored. For example, Greenberg 1971 is not mentioned in Foley's survey of Papuan languages (Foley 1986).

Greenberg did not publish anything further on Indo-Pacific. Instead, he returned to his three-way classification of the languages of the Americans into Eskimo-Aleut, Na-Dene and Amerind. Over nearly three decades, Greenberg assembled twenty-three notebooks of around 80 languages each, with up to 400 lexical entries for each languages, and six additional notebooks with grammatical comparisons. In 1987, one year after retiring from Stanford University, Greenberg published *Language in the Americas* (Greenberg 1987a). In it, he presented evidence, again both lexical and grammatical, for eleven subgroups of Amerind and for Amerind itself. He did not present evidence

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for Eskimo-Aleut (that being accepted), and presented only a response to an attack on Sapir's Na-Dene family. The book begins with a general defense of his method and a critique of the comparative method, and concludes with a suggestion that all of the contemporary languages of the world may form a valid genetic unit (the monogenesis hypothesis).

Greenberg's Amerind hypothesis, although anticipated by others (Greenberg 1987a: 40–55), met yet a different fate from his African and Indo-Pacific hypotheses: it was vehemently rejected, and it launched a debate—which has not yet ended—about the validity of the hypothesis and Greenberg's methods of linguistic genetic classification. Greenberg participated vigorously in this debate, contributing some twenty responses, replies, commentaries, and reviews of his critics (Greenberg et al. 1986, Greenberg 1987b, and the relevant bibliographical entries at the end of this obituary). Greenberg consistently maintained that a quantitative probabilistic argument is required to 'prove' an empirical scientific hypothesis; that he used the same methods for linguistic genetic classification in the Americas as in Africa; that this method was the same used to identify the now-accepted language families in the eighteenth and nineteenth centuries; that this method necessarily precedes reconstruction, since reconstruction presupposes a classification; and that alternative nongenetic hypotheses (such as extensive language mixing, extensive borrowing of basic vocabulary and grammatical inflections, or sound symbolism) were sociolinguistically implausible or not persuasively supported by attested sociohistorical developments in shallower, widely accepted language families.

Another controversial aspect of Greenberg's Amerind hypothesis was the support it received from physical anthropology and from genetics. Stephen Zegura and Christy Turner independently hypothesized a three-migration pattern into the Americas based on dentition and genetic evidence; the three of them published their results together (Greenberg et al. 1986). In addition, the geneticist Luigi Luca Cavalli-Sforza compared genetic groupings of humans and Greenberg's linguistic classification, and found a high degree of similarity (Cavalli-Sforza et al. 1988, see also [235]), which led to further controversy. Greenberg was of course encouraged by this convergence of independent evidence, but he always insisted that the linguistic classification must be established on linguistic evidence alone.

Greenberg continued to publish on diachronic, typological and other topics, but the main focus of his research after retirement was genetic classification. His next area of study was Eurasia. He continued to gather lexical and grammatical evidence for a family he called Eurasiatic, consisting of Indo-European, Uralic, Altaic, Korean-Japanese-Ainu, Gilyak, Chukchi-Kamchatkan and Eskimo-Aleut. He published a number of articles presenting parts of this evidence ([199], [205], [212], [228], [238], [240]). In 2000 Greenberg published *Indo-European and its closest relatives: The Eurasiatic language family vol. 1: Grammar* ([245]), containing a historical overview, a discussion of the phonology of Eurasiatic, and seventy-two independent pieces of grammatical evidence. Although many scholars had compared pairs of families (e.g. Indo-European and Uralic, Uralic and Altaic, Altaic and Japanese), Greenberg argued that all of the aforementioned groups together constitute a valid genetic unit.

Although Greenberg did not know at the time that he had only two years to live, at the age of eighty-four he proceeded to write the second volume (the lexical evidence) at a frantic pace. 'I am fighting against time to get the second volume finished', he wrote me in January 2000. He submitted the final etymologies to Merritt Ruhlen for typing on October 27, 2000, and went into the hospital that evening. He was diagnosed with pancreatic cancer, and stayed home with Selma from then until his death. But he

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worked with Ruhlen until mid-March 2001 on finalizing the lexical evidence. He had no intention of stopping short of a complete genetic classification of the world's languages, which he believed to be possible. He planned to turn next to a southern group consisting most likely of Niger-Kordofanian, Nilo-Saharan, Elamo-Dravidian, Indo-Pacific and Australian. He retrieved his old notebooks, but realized that he needed more sources, and did not have the time and energy to proceed further.

During his long life, Greenberg received many accolades: twice fellow at the Center for Advanced Study of the Behavioral Sciences, thrice Guggenheim fellow, a member of the American Philosophical Society and the National Academy of Sciences, president of the Linguistic Society of America, the African Studies Association, and the West African Linguistic Association, and the LSA Institute Collitz Professor. Greenberg gave the first Distinguished Lecture of the American Anthropological Association, and received the Haile Selassie Award for African Research, the New York Academy of Sciences Award in Behavioral Science, and the National Academy of Sciences/American Association for the Advancement of Science Talcott Parsons Prize in Social Science.

Yet despite the controversial positions he took from the beginning of his career to the end, and the stature he gained in the field, Joe Greenberg was one of the most mild-mannered and self-effacing scholars imaginable. He was the scholar's scholar. He office was Green Library at Stanford, where he worked all day, six days a week (down to five in his last decade), always reading and making notes in pencil in his famous notebooks. The library staff one day surprised him by installing a brass plaque on the oak reading table where he worked, inscribed 'The Joseph H. Greenberg Research Table'. His erudition was awesome but he wore it lightly. He could recall obscure facts about languages anywhere in the world (though in later years he said, 'Every time I learn the name of a new student, a fact about Nilo-Saharan flies out of my head'). Only a few years ago he lamented to me that when he read a grammar, he no longer remembered everything. He gave up trying to learn Japanese in his sixties, saying he was too old to learn a difficult language and writing system; but at eighty-five he told me he could read most of the Japanese entries in an Ainu-Japanese dictionary he used. When he reviewed his African notebooks at the end of life, over four decades after he wrote them, he was disappointed that he couldn't remember the specific word forms. If only I had these problems.

Joe Greenberg used to say that he 'learned more from languages than from linguists'. To a great extent, this was true. He was a deeply empirical scientist, devoted to creating an empirical science of linguistics, based on a full range of facts from a full range of languages. But he also was deeply knowledgeable about the history of linguistics. (I never had the opportunity to take his course on the history of linguistics, but he told me that he usually got to about the Renaissance by the end of the course.) He could quote freely from the great nineteenth-century German historical linguists, but he also followed developments in contemporary linguistic theories, and of course read the specialist language journals. To the end of his life, he possessed a curiosity about and a sense of wonder at language and at the world—the mark of a true scientist.

His achievements stand as a profound reminder that, as Bernard Comrie once wrote, 'linguistics is about languages'.

[William Croft, University of Manchester.]

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