The Methods and Purposes of Linguistic Genetic Classification[*]

Joseph H. Greenberg

Stanford University

This paper discusses three questions relating to genetic classification. First, regarding the criterion problem, it concerns the nature of the linguistic resemblances and distinguishes the different properties and characteristics of typological classification, areal classification and genetic classification. Secondly, with regard to the methodological problem, it discusses several principles of genetic classification and considers both the positive application and the limit of the three methods of genetic classification, namely comparative method, multilateral comparison and glottochronology. Finally, with regard to the justification problem, by comparing the genetic classification with both the other two classifications and other fields of knowledge, it provides explanations why genetic classification has had a central and unique position in linguistics.

Key words: linguistic classification, typological classification, areal classification, genetic classification, methodology

Like any other set of objects, individual languages can be classified by many different criteria or combinations of criteria. By a classificational criterion will be meant a property or set of properties such that all the objects which possess them belong to the same set and those which do not belong to different sets. Moreover every object belongs to some set and no object belongs to more than one. The sets that result are said to be mutually disjoint and exhaustive of the universe of objects being classified and to constitute a partition.

The foregoing is, of course, based on the traditional notion of classification in which the ideal is to specify the necessary and sufficient conditions for any group of objects to constitute a class. Such a classification is often called categorical. In the last two decades, however, the idea that it is justifiable and useful to relax such

---

[*] Professor Greenberg contributed this paper to a conference at the Center for Advanced Studies in Behavioral Sciences at Stanford, organized by L.L. Cavalli-Sforza, M. Feldman, and myself. It was to appear in a volume of proceedings, which unfortunately never materialized. The paper discusses central issues in theoretical linguistics and contains numerous important insights. With Professor Greenberg's consent and support from the editors of *LL*, it is published here. －W. S-Y. Wang

requirements has been widespread and is generally formulated by means of the concept of "prototype". We have in place of necessary and sufficient conditions a cluster of properties which are empirically found generally to coöccur, although not in every instance. Objects which most fully partake of this cluster of characteristics are then said to be prototypical.

Such an approach to classification is in many instances sensible and useful, but it seems undeniable that categorical classifications do exist and that in a sense the approach through prototypes is a form of "sour grapes". Put perhaps paradoxically, categorical classification is the prototypic form of classification. For the moment at least, we shall adhere to it, so that by classification *tout court* we shall mean categorical classification.

There is a further general characteristic often found in classifications which we may call hierarchy. There are levels of classification based on the logical property of containment. An obvious example in linguistics is genetic classification of languages, and it finds expression in the family tree diagram. Thus, English belongs to the class of Germanic languages, while the Germanic languages in turn are contained in the higher grouping known as Indo-European. As we shall see later, this same property of hierarchy is found elsewhere, such as in typological and areal classifications. However, where the lowest level is not categorical it may have somewhat different logical characteristics with regard to the property of logical containment.

There is yet another factor to be considered in regard to classifications and which arises in more than one of the major kinds of linguistic classifications. When we carry out a classification in which languages as wholes figure as units (as when in genetic classification we place English and German together as members of the Germanic family of languages, or as in the nineteenth century morphological typology we classify Turkish and Tamil together as agglutinative), we can distinguish two levels in dealing with the evidence. One is a lower level of individual resemblances; e.g., cognates in the case of genetic classification and individual typological resemblances or what are sometimes called the dimensions of a typology. For instance, in regard to word-order typology, in appendix II (Greenberg 1963a) 24 types of languages are distinguished based on subject-verb-object order, the relative position of a noun and its dependent genitive, the existence of prepositions as against postpositions, and the relative order of adjectives and the nouns which they modify. On this basis Hindi, Mordvin (a Finno-Ugric language), Japanese and many others are classified together under Type 23. This common membership is based on agreement in the four factors mentioned above; they are all SOV, have the genitive preceding the governing noun, have postpositions and in all of them the adjective regularly precedes the noun. Similarly, in areal classification the individual traits such as the existence of a suffixed article which help to delineate

the Balkan *Sprachbund* are on a different level than the languages themselves that are being grouped together areally.

The individual comparable properties may be called traits of the classification, as against the level of classification proper in which languages as a whole are assigned to a single group. Many important questions arise regarding this relationship; for example, the number and degree of independence of the various traits, and whether or not (as in the typology of word order) these traits are organized on a set of dimensions. In the subsequent discussion we shall talk about the trait level and the language level when it is necessary to make this distinction, regardless of the type of classification being discussed.

When linguists talk of the classification of languages and do not add qualifications, as when they say that English is to be classified as a Germanic language, they are employing what is often called genetic, or historical linguistic classification. In the orthodox view at least, such a classification is categorical: if English is a Germanic language, then it cannot be a Romance language.

The basic purpose of the present discussion is to answer three distinct but related questions relating to genetic classification. Since, when classifying, whether categorically or prototypically, we are always concerned with resemblances, the first question we ask concerns the nature of the resemblances which are to be considered relevant to any particular kind of classification, as distinguished from other modes. We may call this the **criterion problem**. Secondly, assuming that we are clear concerning the relevant criteria, there remain concrete problems regarding just how we are to proceed. Let us call this the **methodological problem**. Finally we may ask why of all the ways in which we can classify languages, the genetic type should be considered classification *par excellence*. Let us call this the **justification problem**.

The answer to this last question, it should be pointed out, does not entail the view that other modes of classification might not be useful for other entirely legitimate ends. What we do want to know is why genetic classification has had a unique status in linguistics. In this regard, the term *genetic* (which would seem to be metaphorical) does, as we shall see, have a justification in that its parallel in biology (evolutionary taxonomy) is likewise the preëminent and basic manner of classifying species. We shall start, not by a direct attack, but by an enveloping movement, by considering other ways of classifying languages in order to highlight by contrast and thus disengage the basic properties of genetic classification.

Let us consider what is, at first blush, a peculiar and indeed even foolish way of classifying languages. Yet to specify why it is foolish will, I think, not turn out to be a foolish exercise. Let us consider a standardized form of language names as spelled, e.g., in the Voegelins' volumes on the languages of the world. We could then classify all

languages by means of the initial letters of their names. Such a classification, in which *Amharic* would belong to the same group as *Atakapa* (an Amerindian language of Texas), while *Zyryan* (a Finno-Ugric language) would go with *Zulu*, would obviously be categorical, since it would be complete and without class overlap. The reason that it is of no scientific interest is that the set of languages with the same initial letter in their names would have nothing in common except that fact itself. Another consideration is that in a sense it is not linguistic because the property of having a certain initial letter would not be in itself a fact about the English language, but about the spelling of the word *English*. Such metalinguistic facts are but a variety of a larger set of facts about any language which we may call external, as opposed to internal. For example, statements such as "spoken by more than one million people" or "used in higher education" are examples of external properties that are not metalinguistic, as opposed to saying that a language possesses "labial stops", which is an internal property.

Clearly it is possible to have useful classifications, such as sociolinguistic ones, into standard and non-standard languages, which utilize external criteria. In the case of pidgins and Creoles we have an interesting situation. It seems clear that the basic definitions are here based on external criteria. A pidgin is a language which is no one's first language, while a Creole language is one which developed out of a pidgin by acquiring first-language speakers. However, a central problem of the study of these languages is whether there are likewise internal linguistic properties which these languages possess and which may in fact be unique so that one would recognize a language as a pidgin or a Creole without knowledge of the linguistically external facts that have just been mentioned. Among oft-cited characteristics are the absence of inflectional morphology and a limited lexicon.

The aforementioned properties are what would usually be considered typological. We shall therefore consider next this important form of classification. We may proceed, so to speak, heuristically by enumerating the sorts of criteria which would ordinarily be considered typological and then seeking to isolate, if possible, what, if anything, they have in common.

We may start by pointing out that all languages contain numerous items which involve the association of a particular sequence of sounds with a particular meaning, which, following de Saussure, is often called arbitrary. What is meant here is, I believe, not the exclusion of the obvious facts about sound symbolism and the numerous other iconic facts about language. We may restate the principle of the arbitrariness of this association in the following way. Suppose someone were to describe on the basis of first-hand observation a hitherto unstudied language in New Guinea and assert that the word for mother was *papa*. We would not be able to assert that he was wrong because it reversed the usual facts regarding sound symbolism for terms designating the female

parent. In other words, potentially any sound may designate any meaning, although the probabilities of a particular combination may in some instances be very low. However, they are never zero.

When it was stated earlier that in the widest sense a language contained numerous pairs in which sound was associated with meaning, the reason for stating it in this manner was that we wish to include here not only lexical items in the usual sense, e.g., the word *hand* in English, but also concrete grammatical markers, e.g., the *-er* of the adjectival comparative. In other words, our unit is the *morpheme* as the term was used in American structural linguistics. Generativists employ the term *formative* for roughly the same concept.

Given the existence in all languages of numerous morphemes associating specific sounds with specific meanings, we can abstract from one or the other. If we consider the sound in abstraction from the meaning we have a phonological typology. For example, we could classify the languages of the world into those which have voiced stops and those which do not. In such a classification we are abstracting from the meanings of the forms containing voiced stops.

The obvious counterpart of this is to consider meaning in abstraction from sound. The most interesting typologies here are those which involve grammatical morphemes. For example, we could classify languages which possess a morpheme for the dual number in the noun into one class, and those which do not into another.

Classifications involving lexical items as such seem to be in many instances uninteresting. Thus we might ask whether languages had a word for 'nose', abstracting once more from the particular sounds involved in expressing this concept. However, this sort of typology is not *always* uninteresting. We might, for example, want to find out just what concepts are expressed in all languages and which are not. Further, there are areas of vocabulary that are quite structured, though these are few. Among them would be numeral systems and systems of kinship terminology. Here complex typologies are possible and interesting. Much of the work done by ethnosemanticists falls into this area. To ask then whether a language has distinct terms for 'mother's brother' and 'father's brother' is interesting both because languages differ in this regard and because correlations with social structure can be established, as well as other semantic facts about the languages. Thus if a language has distinct terms for 'mother's brother' and 'father's brother', it almost always has separate terms for 'mother's sister' and 'father's sister'.

In the framework for typologies discussed thus far, there has been no provision for what is probably at present the most popular of all typologies, namely that which has to do with the order of morphemes or words. It would seem to involve a combination of form and content quite analogous to that involved in the association of sound and

meaning. There is a formal aspect, namely whether something precedes or follows something else (which would correspond to sounds) and the grammatical categories involved (which seems to correspond to a kind of meaning). Thus if we state that a certain language belongs to the SOV type, the ordering of the three elements is a formal criterion akin to that of the sounds in lexical items, while the grammatical categories of subject, verb, and object are by contrast meaningful. In fact, we find across languages that order and grammatical morphemes are alternatives for expressing particular grammatical relations. For example, possession is expressed in some language purely by order, while some have a grammatical morpheme for the genitive, while still others use some combination of both.

All this suggests that our attempt to define typological classification in terms of the arbitrariness of the sign, so that we basically had two kinds of typology, phonological and grammatical-lexical, to which we then added order typologies in an *ad hoc* fashion, is not adequate, however useful, as an initial approach.

If we consider for a moment the order typologies themselves which involved us in the theoretical problem with which we are now concerned, we may approach more closely to the essential features which distinguish typological classification. This has to do with the number of theoretical possibilities involved. Consider for a moment the typology which utilizes the order of S, O, and V. Logically there are only six possible orders and, of these, two are extremely rare. This strong limitation in possibilities applies also to lexical typologies of the kind exemplified above by the existence of a word for 'nose'. There are only two possibilities. Either a language has a word for 'nose' or it does not.

Both the limited number of possibilities and the fact that these possibilities tend to be distributed very unevenly among languages (e.g., that SOV languages are very common and OSV languages exceedingly rare or perhaps even non-existent), bring it about that languages can quite easily belong to the same type "accidentally", that is, from a historical point of view. Even where the number of logically possible types is quite large, as with systems of kinship terminology, the constraints both of cognitive and social origin are so powerful that the actually occurring systems are a very small proportion of the logically possible ones.[1] As a result languages may easily be similar typologically without a historical connection as the basis for the coincidence. An example of a phonological phenomenon for which this holds is tonality in Africa, East Asia and Mexico; with regard to word order, SOV in Somali and Turkish. It is, of

---

[1] An example is Nerlove and Romney (1967) dealing with sibling kinship terminology. Out of 245 systems investigated, 240 fell into 18 of the 4,140 logically possible types. With a handful of exceptions most of these were in 12 types predicted in advance by a combination of marking theory and a cognitive principle of the avoidance of disjunct categories.

course, possible for a typological resemblance between two or more languages also to be genetic when the agreement results from common inheritance from an ancestral language. However, as we shall see more fully later, such resemblances which are both typological and genetic simultaneously play a very different role in the actual methodology of classification while they furnish certain kinds of insights regarding linguistic change which are not derivable from other sources.

The problem of categorical versus prototypical definitions arises in reference to the delimitation of typological criteria. With regard to word order, the tendency of some analysts has been to classify languages in terms of two basic types: VSO and SOV. Since each of these is more or less associated with other criteria in a polar manner (so that, for example, almost all SOV languages are GN and virtually all VSO languages are NG), we may say that an SOV language which has GN order is more prototypical than one which does not. Similar problems arise at the logically lower level of the definition of the typological traits themselves. For example, a language like French in which adjectives normally follow the noun but a few may precede or follow, is less prototypically NA than Tagalog in which the adjective invariably follows the noun.

A parallel problem arises regarding the meaning of grammatical categories in typologizing. For example, when we seek to identify genitive constructions on a universal basis in order to typologize them, what we find is a cluster of characteristics on the semantic side. In most languages, a construction which is used to express possession of a house or of domestic animals is likewise used to indicate a person's relation to his own head, doubtless because one seems to have an analogous sort of control over it. But a person's head is also part of his body and from this the extension to part-whole relations is not difficult. Hence we find a cluster of characteristics usually found to coöccur; our enumeration, of course, is by no means complete. However, we do find languages like Finnish in which there is a case form which expresses, among other things, possession, but also a separate case called the partitive, which we would probably not want to identify with the prototypical possessive. Our purpose here is not a full discussion, which would obviously be complex and the subject of a separate study. We merely wish to point out that the problem does arise in the case of typological criteria, particularly in regard to grammatical categories such as "subject", the crosslinguistic identification of which raises difficulties and concerning which the notion of prototypicality has, in fact, been utilized by many linguists.

A further characteristic of typological classification is relevant in the context of the present discussion, namely that the number of possible typologies is infinite. There is, further, no contradiction if, in classifying languages along typological lines, two languages belong together in one typology and do not in another. Given the infinite variety of possible typological classifications it will of course result that very many of

them are quite pointless. A fruitful typological classification is one that shows strong correlations with one or more others suggesting some causal connection of a universal nature among the properties involved. It is, of course, for this reason that most recent work in typology has been in connection with the search for linguistic universals. When this occurs the common practice of typologists is not to talk of connections among typologies but to combine them in multidimensional typologies in which the separate dimensions are logically independent but empirically related. This once more shows the typical "arbitrariness" of typological procedures which permits great freedom of manipulation in regard to the definition of types in the search for universal linguistic principles.

Typological classifications may be hierarchical, but the hierarchies display the same characteristic of arbitrariness as the classifications themselves in the sense that has just been explained. For example, we might in a typology of phonological tone classify languages as being tonal or non-tonal. The tonal languages might in turn be divided into those which have level tones only, those which have contour tones only, and those which have both. We might also divide non-tonal languages into those which have phonological stress and those which do not. Clearly we have here a hierarchy within a typological classification. Moreover there is the same type of arbitrariness that we found to be generally true of typological classifications. We might for example have divided tonal languages into those in which there are significant limitations in their sequence based on the word as a unit and those which do not; that is into word-accentual and those which are not word-accentual. This would cross-cut the classification first described, but there would be no logical contradiction in this. It would simply be a question of fruitfulness in regard to further results as noted in the earlier discussion.

There remains one important type of classification to discuss before we consider genetic classification in detail in relation to the questions raised at the beginning of this paper, namely areal classification. The problem with which areal classification deals arises in the following manner. If we plot on a map the geographical distribution of linguistic traits, we often find that this distribution is not a random one. This is equivalent to saying that they cluster in such a way that if languages which are continuous or not distant to each other share one trait they often share a whole series of others. However these traits must first be analyzed in order to determine the reasons for this non-randomness. A linguistic area is defined by a set of traits whose common occurrence in the languages has arisen by a process of linguistic contact over time. Just as we found that in particular instances a trait might be both genetic and typological, so we may find that a particular trait may be both typological and areal without there being any contradiction. However it cannot be both areal and genetic at the same time since this would involve two different and mutually exclusive historical explanations.

Initially we shall only consider typological traits and, in fact, these are the ones most commonly employed in defining linguistic areas. However, the actual distribution of typological traits found on a map is, as it were, a surface phenomenon. This is because resemblances can result in three different ways and only one of them is relevant for areal classification. The first of these is sheer accident. For example, given the large number of SOV languages in the world a whole group of contiguous languages could share this characteristic for accidental reasons. The term "accidental" in this context means historically independent. As is evident already from the statement that areal resemblances are those arising from language contact, we see that areal classification shares one important property with genetic classification: namely that it is, as opposed to typological classification, historical, whereas typology is ahistorical. By this we mean that a typological resemblance remains a typological resemblance whether it results from historical processes or not.

The second type of resemblance in a set of geographically contiguous languages are those which result from unchanged genetic inheritance from an ancestral language. These also are not relevant for areal classification since they do not result from language contact. On the other hand, it does count as evidence in defining a linguistic area if a set of contiguous languages all develop a dual number not inherited from a common ancestral language and as the result of a historical process by which bilingual speakers innovate this category in one of the languages they speak because of the structural influence of the other. Since what we are interested in here is the influence of one language on the other, we need not confine ourselves to the typological traits which we have just been considering. Hence we can include loan words, which, of course, involve resemblance in form and meaning simultaneously and are thus not typological.

Thus far we have been considering the types of traits which are significant for areal classification, but we have not shown how they result in an areal classification of languages. The possibility of classifications of this kind depends on the existence of situations in which particular languages and sets of languages have more similarities resulting from contact in one geographical direction than another. A classic case is that of the languages of the Balkans. Romanian, Albanian, Bulgarian, and Greek share, in addition to many loan words which have diffused from one of the languages to one or more others, a series of typological characteristics. These include the absence of an infinitive, a suffixed definite article, and the formation of a future tense by means of a particle which derives from a verb meaning 'to wish', or in the case of Romanian is the conjugated verb itself. Serbo-Croatian shares these characteristics to a lesser degree, and in certain respects, e.g., the possession of vowel length, resembles Hungarian to the north, which is not geographically a Balkan language.

The Balkan languages thus form what is sometimes called a *Sprachbund*, literally a 'language confederation'. Such an areal classification has the typical hallmarks of prototypicality. It is defined by a cluster of traits any one of which may be absent in at least one of the languages. A language which contains all or nearly all of them may be said to be prototypical, while in other cases we have languages which have relatively few of these characteristics and share some with other neighboring areas, as in the instance of Serbo-Croatian. We thus have the phenomenon of *fuzzy sets*, which frequently accompanies prototypicality. One should note that all of the languages of the Balkan speech area are Indo-European, but the properties that define the speech area are all subsequent innovations produced by contact, and not those which result from their common Indo-European inheritance. Only in relatively few instances have attempts been made to define speech areas; e.g., Sandfeldt 1968 (Balkans), Masica 1976 (South Asia) and Greenberg 1984 (Africa).

The above exposition might make it appear that distinguishing those resemblances among neighboring languages which are the result of contact from those which are to be explained by genetic inheritance and those which are exclusively typological (that is, not deriving from either contact or genetic survival) is a straightforward matter. In fact, the reasoning, particularly in regard to typological resemblances, is largely probabilistic, and it is the existence of a number of these, of which any single one is not completely certain, that provides cogent evidence for significant contact phenomena. The following example will perhaps help to illustrate this point.

The Thai group of languages have in almost all instances basic SVO order, are prepositional, and have the dependent genitive after the noun. The Khamti language belongs to the Thai group, but is geographically isolated from the rest; it is spoken in Burma and neighbors languages of the Tibeto-Burman group and Assamese, which is an Indic (hence Indo-European) language. Both the Tibeto-Burman and Indic languages are SOV, postpositional, GN languages, here and in most other areas. Khamti is SOV, has some postpositions and variable genitive order. It is, of course highly plausible that these word order properties of Khamti developed through contact with the Burmese languages in the vicinity. Yet there are well attested instances of change from the SVO to the SOV types through purely internal factors. It simply becomes much more probable in this case to attribute the change to linguistic contact factors. We may ask why, of the numerous Thai languages, only Khamti has these characteristics at the same time that it is the only one which has been in contact with SOV languages.

It was noted in the preliminary discussion that there are two levels to be considered, that of individual traits of resemblance and that of languages as wholes on the basis of these individual traits. In the case of genetic classification to which we now

turn, the lower level resolves itself into a consideration of what are usually called cognate forms.

In the case of genetic classification, the question of the nature of relevant resemblances has been, I believe, a major source of misunderstanding over the methodology of classification. Let us consider first the kind of resemblance which was in the initial exposition stated to be non-typological, namely those involving sound and meaning simultaneously. Thus we may say that English *tongue* and German *Zunge*, with the same meaning, are similar both in sound and meaning and that this similarity derives from a common original that can be reconstructed for Proto-Germanic. Let us call this sort of similarity diachronic genetic similarity. The reason for including the term genetic is that similarities resulting from borrowing are also diachronic in nature; they both involve processes which take place over time. However, in the remaining discussion, in order to simplify our terminology, the term *diachronic similarity* will be employed to mean diachronic genetic similarity, unless otherwise indicated. What we are interested in is the kind of similarity between a linguistic form involving sound and meaning, in its earlier and later forms, whether it occurs within the history of a single language or independently from an earlier common form ancestral to a number of languages.

There are certain logical characteristics of diachronic similarity which are different from that of similarity as it is understood in its application as a classificational criterion in practically all other instances. One of these is that similarity is generally conceived to be symmetrical. If A is similar to B, then B is similar to A. In phonetic change we would naturally say that a sound will in general change to a similar one. For example an unvoiced consonant often changes to a corresponding voiced one. Therefore, the earlier and later forms share a set of common features, all except voicing, and it is in these shared features that their similarity consists. Moreover, it seems natural to assert that this is a symmetrical relationship. If a t is similar to a d then surely the similarity must hold in the other direction and to the same degree. However, there are instances in which a change can occur in one direction but not in the other. Thus there are many attested instances of $s > h$ but, as far as I am aware, none of $h > s$. However, diachronic similarity is non-symmetrical, rather than asymmetrical, since the majority of changes are symmetrical. Thus both $e > i$ and $i > e$ are possible changes.

Further, in synchronic similarity we are free to define degrees of similarity in terms of the number of shared features according to some overall phonetic analysis of sounds into combinations of features. However, while as empirical fact diachronic similarity often coincides with synchronic similarity, this is not always the case. For example, as we have seen, sibilants often change into *h*-sounds, but in every synchronic scheme (of which I am aware) they differ by a whole set of features.

These considerations also hold in regard to semantic change, but with an added twist, which increases the complications. When one sound replaces another, the first normally disappears from the language, with a usual transitional period of free variation.[2] In semantic change however the old meaning in the general case persists so that, as we can see in looking at the dictionary entry for any common word, there are a series of meanings, most of whose interrelationships are apparent in terms of semantic similarity based for the most part on metaphorical transfers and metonymic shifts, which are the most frequent types of semantic change. However, often some of the connecting links no longer exist in that the word in some particular meaning has been replaced by another lexical item. In addition, the cumulative effect of a set of changes, particularly metonymic, which are often surprising, combined with the replacement of certain meanings just mentioned, often leads to a situation in which historically connected meanings of the same original form become, viewed synchronically, homonyms.

As a result, a historical arrangement of the varied separate senses of a single term resembles a genealogy, in which some members have died. It is then no wonder that the search for necessary and sufficient conditions for the definitions of words in natural (as opposed to logically devised) languages is often futile. When Wittgenstein made his celebrated remark about the various senses of the same word showing a "family resemblance", he created a very apt metaphor, but in his ignorance of historical considerations regarding semantic change he did not realize how this had come about.

To summarize, in regard to individual resemblances, which correspond to the notion of trait in the initial discussion, we have in effect asserted that forms are likely to have a common origin if they could have descended by known types of change from a single original. It may have been noted, particularly by linguists, that in saying this we have alluded neither to regular sound correspondences nor to regular sound changes.[3] This is because regular sound change, whether conditioned by neighboring sounds or unconditioned, is just one of many processes which are known to occur in sound changes. Moreover many sound changes are known to be irregular.

---

[2] It does happen however that a sound change is incompletely carried out so that, depending on the dialect and the word, a particular change is or is not carried out. Sometimes both sounds survive and the doublets acquire different meanings. These facts were well known to earlier dialect geographers who coined the slogan that each word has its own history. The residues of such a process are found in the so-called incomplete satemization of certain branches of Indo-European in which certain words have fronted the original velars and others have not in a manner which differs from branch to branch. The work of Wang (1969, 1977) and his associates on "lexical diffusion" belongs here.

[3] For a fuller discussion of the relation between evolutionary theory in biology and linguistics including historical references, see Greenberg (1959).

Further, conditioned sound changes may produce regular alternations of sounds in grammatically related forms. Such morphophonemic alternations are generally subject to the unifying force of analogy in which one of the alternants replaces the other. When this occurs the direction of change usually differs in individual cases and in an independent manner in related languages which have inherited the alternation. This process is called reverse analogy and results in completely sporadic correspondences. The Neogrammarians, to whom we are indebted for the general concept of regular sound change, were well aware of analogy as the second major factor in sound change.

Take for example the various subsequent changes in Germanic after the alternations in Proto-Germanic due to conditioned changes in consonants, summarized in Verner's law. One of the conditioned changes was an alternation of *s and *z (the latter often becoming r). Yet simply a comparison of certain related English and German words will show instances where the expected outcome has been overridden by non-phonetic factors: English *was* : German *war*; *hare* : *Hasen*; *born* : (*ge-*)*boren*; *rose* : *Rose*. In general, across n languages there will be 2^n sporadic correspondences. These are just some of the reasons why, as all sophisticated etymologists know, etymology can never be a completely exact science in which all problems can be solved by the application of rigorous methods. We are dealing with probabilities, which are, however, in many instances very high.

We now come to the question of the actual methodology of classification in the light of the characteristics of genetic resemblances at the trait level, which figured in the previous discussion. What we are interested in here is the higher level of languages as such and their genetic classification. In doing so, we consider, in regard to each principle, both the positive methodological procedure it gives rise to and the consequences of its disregard which leads in each case to a specific and often widely held fallacy standing in the way of progress in regard to the whole problem of genetic classification.

The first of these principles flows from our consideration of the nature of genetic and typological resemblances. There are, as has been seen, resemblances which are purely genetic and those which are both typological and genetic; for example, agreement in certain features of inherited word order among languages of the same genetic stock. However, in going about classification, there are two reasons for disregarding the latter in carrying out a genetic classification. One is that, given the small number of typological alternatives, the possibilities of accidental convergence are high. The other is that the very possibility of distinguishing typological resemblances which are also genetic from those which are only typological depends logically on the prior establishment of a genetic classification. The use of typological criteria to classify languages genetically, at least as soon as one passes beyond the most obvious

groupings, was very common in the nineteenth century. The problem is now much better understood, but arguments of this type are still fairly persistent, generally in negative argumentation, as when it is asserted that a particular non-tonal language cannot be genetically affiliated to a group in which the other languages are tonal.

Since genetic non-typological resemblances were defined earlier as those involving sound and meaning simultaneously, what this means is that, in effect, we shall begin with lexical items as well as grammatical morphemes, considering the latter with regard to both sound and meaning. We shall call such grammatical resemblances concrete, as distinct from those which are typological. For example the agreement of English and German in having an adjectival comparison marker -er is both concrete and typological, while the agreement of French and Tucanoan, a group of South American languages in having masculine and feminine gender is not. Concrete grammatical markers are extremely valuable as evidence in carrying out genetic classification and they figured in a central way in the earliest work on Indo-European. However, lexical comparisons are, so to speak, the bread and butter of genetic classification for two reasons. One is that they are always present, at least in so-called basic vocabulary. There is always a word for 'nose', but relatively few languages have overt markers for the comparative of the adjective. The second is purely practical. There is a vast number languages in the world, some of them now extinct, for which these are essentially all the data that we have.

In moving from the trait to the language level, we shall necessarily be concerned not with single resemblances in sound and meaning, but their clustering in such a way as to lead to the grouping of whole sets of languages. This aspect of method, namely the relationship between the trait and the languages level, brings into play two important considerations: the relative independence of each trait and its relative weighting.

Essentially each item is independent. We may state this in the form of a maxim. Just because you call a *mouth* a *mouth* is no reason to call a *nose* a *nose*, though you will probably not call it a *mouth*. This principle is of great importance in that for independent items the joint probability of accident becomes the product of their individual probabilities and hence is vanishingly small even with only a few instances. However, all items are not of equal weight. One consideration is length. Other things being equal, the longer the item the less likely it is to be accidental. Sound symbolism is another factor. The agreement of languages in having a word for the female parent such as *mama* is obviously of relatively little weight.

There is another sort of resemblance, on the other hand, which is of particularly great weight. Up to now we have simply talked about resemblances simultaneously involving sound and meaning. We may state this more exactly in the following form.

The unit of interlingual comparison is the morpheme in the sense in which the term was used in American Structuralism. We are concerned with the morpheme as having in many instances a number of variant forms or allomorphs. Agreement in alternation among allomorphs is clearly of very great weight. The more irregular it is, the more powerful it becomes. The most powerful of all is agreement in suppletive alternation, where the allomorphs are derived from originally distinct morphemes. Thus the agreement of English with the other Germanic languages in the forms of the positive, comparative and superlative of *good* is of such great weight that by itself it is sufficient to show that the Germanic languages are related to each other. However, it is not sufficient to show that the Germanic languages are a valid genetic group in the sense discussed earlier. The reason for asserting this is that the absence of this alternation is not sufficient in itself to prove that a language is not Germanic, since such irregularities are obviously the targets of analogical levelling. On the other hand, they are sometimes of such historical depth that they are evidence of groupings which exceed those of the level of Germanic in age. In the present case neither of these two strictures holds, but, of course, there is a vast amount of additional evidence to show that the Germanic languages are a valid genetic group at some level. Another way of saying this is that, at least taken in isolation from other resemblances, evidence of the type just discussed is useful for relationship rather than classification.

In addition to the independence of each trait and their relative weighting, there is a third factor. This is the importance of the recurrence of similarities across more than two languages or language groups. Here as with trait independence there is a powerful probability factor. If the probability of an accidental resemblance between two languages is p, then for three languages it is $p^{3/2}$ and, in general, for n languages it is $p^{n/2}$. This rapidly becomes infinitesimal. Hence the agreement of a number of languages in a number of items, each logically independent but recurring over the same group of languages, provides the basic evidence for genetic grouping and is most easily brought into play by the technique of multilateral comparison.

In distinguishing between relationship and classification we arrive at the second basic principle, one which is, I believe, the chief source of error at the present time. Our primary purpose is to classify languages genetically. This means that we seek to find valid genetic groups, that is, languages that are more closely related to each other than any is to any language outside the group. Thus Swedish, Albanian and Armenian are all related to each other, since they are Indo-European languages, but they do not constitute a valid genetic group at any level. Since classification is hierarchical, hypotheses of classification are much richer than those of relationship without level specified. From classifications we can deduce many hypotheses of relationship, but not vice versa. Thus, given a complete table of Indo-European classification, we can

deduce the statement above concerning the relationship of Swedish, Albanian, and Armenian, but from this fact alone we are not able to give a classification on any level.

The situation does not change when we are dealing with deeper level classification. Thus a number of linguists have for a considerable period of time sought to show that Indo-European and Semitic are related. It is finally being realized (at least by some) that, since there is an obvious case for the greater resemblance of Semitic to Egyptian, Berber, Cushitic, and the Chadic groups, which form Afroasiatic, there is no point in comparing Indo-European with Semitic alone and the relationship, if it exists, must be with Afroasiatic as a whole. Most linguistic stocks do not have only two branches, and at an earlier period, in which isolation of human groups must have been greater than at the present period, this is even more likely to have been the case. Hence isolated hypotheses simply seeking to show that some language group is related to some other one, without bringing in a broader range of evidence to show that they form a valid grouping, is irrelevant. It is noteworthy that almost all hypotheses of this kind seek to connect some well-known or historically important family with another of the same sort or with a favorite language of the investigator, often his own.

There is involved here a principle which we might call linguistic democracy: in forming hypotheses, all languages are of equal weight. In the late eighteenth and early nineteenth centuries there was a great reluctance among Hungarian linguists to admit that the languages closest to Hungarian were Vogul and Ostyak, although this obvious connection had been pointed out by a number of pioneer historical linguists. The most popular theory, at least among Hungarians, was that their language was related to Classical Greek.

Another way of stating the foregoing considerations is that whenever we find a number of languages which resemble each other consistently, more than any resemble languages outside the group, we need an explanation of this obviously non-random phenomenon; and our explanation is that they are later developments from an earlier single ancestral or proto-language, as it is commonly called. When stated in this manner, it shows the intimate relation between the subgrouping and classification. In fact, if all the languages of the world are related, the problems become identical: the subgrouping of a single language family. A group stands out most easily (in regard to the types of resemblances just discussed) against the background of other groups which do not share the specific properties which mark out the group as such and distinguishes it from others. The best control against chance resemblances is not some fixed percentage but that furnished by other languages.

The method just described is what has been called inspection and considered by many as "superficial", in contrast to the comparative method which is based on regular sound correspondences. Actually, as we can see from the preceding sections, it is a very

powerful method. Sometimes by inspection is meant merely pairwise comparison of languages. Clearly, this is not what is being advocated here. Moreover, in assessing resemblances, the existence of resemblant forms in a number of languages allows us to test much more adequately than with pairwise resemblances whether the forms have the hallmark of a valid etymology, namely that we can deduce, even if roughly, what the ancestral form must have been.

In fact, there is no opposition between multilateral comparison and the comparative method. It is rather the first step in the comparative method itself. This is because, before we can start systematic comparison and reconstruction, we must know which languages to compare. The most that is claimed by the advocates of the comparative method in this restricted sense (that is, omitting the initial step of classification) is that it "proves" hypotheses of relationship, not that it produces the hypotheses that are to be proved.

That the setting up of such hypotheses is a real problem can be shown from the following considerations. The possible ways of partitioning n objects is a recursive function which grows at an enormous rate. For 25 languages it can be calculated that the number of classifications, without subgroupings, is of the order of 10^{18}. For the hundreds or even thousands of languages with which we have to deal, the number of possible classifications is truly astronomical. Yet, if we simply examine a few basic words in all the languages of Europe, the correct classification into Indo-European, Finno-Ugric, and Basque fairly leaps to the eye by the time we have reached the second or third word, and along with this the universally accepted major subgroupings of Indo-European. In actual practice what is used is essentially similar to the method of multilateral comparison, and it was utilized in making the basically correct classifications on which the comparative method was first employed. In fact, the essentials of this method were not worked out until at least a half century after the classifications were made, so they could not have been used in making them. Again, in Sub-Saharan Africa, Meinhof (1932), who did the first reconstruction of Proto-Bantu, had already decided (as had many before him) what a Bantu language was. He actually used only eight languages for his reconstruction. Later Guthrie (1967-71) also used a limited but larger sample of Bantu languages. There are literally hundreds of Bantu languages for which derivation from the reconstructed forms has never been carried out, and no one seriously doubts their Bantu affiliation. Yet one often encounters in the literature the statement that the genetic affiliation of a language is not proven until its derivation from a reconstructed proto-language has been demonstrated.

Another case in point is Finno-Ugric and the larger Uralic family to which it belongs, along with Samoyed. The recognition of Finno-Ugric as a family preceded that of Indo-European (Sajnovics 1770), and even the most conservative today recognize

Finno-Ugric and the larger Uralic entity as valid. Yet in Szinnyei (1910), 140 years after the pioneer demonstration of Finno-Ugric, no completely reconstructed Proto-Finno-Ugric forms are presented, although consonant correspondences are stated, a number of them problematic. As for the vowels, all that Szinnyei indicates is that a form contains either those with front or back harmony. Even this is uncertain in many instances.

In Collinder (1960), for the first time to my knowledge, complete reconstructions are presented both for Finno-Ugric and the wider Uralic family. However they are preceded by the statement (p.405) that "it is a matter of course that in many instances the reconstruction is more uncertain than the etymology which it is based upon ... therefore the reader may put question marks *ad libitum*." Later, Collinder apparently reconsidered, since in his 1965 work he returned to etymologies unaccompanied by reconstructions.

Reconstructions change over time, or are not even carried out (Afroasiatic), or carried out only partially (Uralic), yet the classification remains secure along with a number of fundamental and obvious etymologies which survive all vicissitudes.

Regarding the details of method, it might appear that since the world is the only natural unit, multilateral comparison of all the world's languages should, in principle, be carried out simultaneously, using the most stable elements of the vocabulary, including pronouns.[4]

Such an approach is clearly impracticable, and in fact unnecessary. In actual practice we face a situation which varies for different areas of the world. Thus, since families like Indo-European and Uralic are well established and etymological dictionaries are readily available, we may use reconstructed forms, or approximations to them where they are not given. Even where starred reconstructions are supplied, one will wish to examine the actually attested forms which often provide important clues.

The opposite situation obtains in areas like South America, in which scores of independent families are stated to exist and comparative works are almost non-existent. Even here one will not have to consider every last language. For obvious and extensive groupings like Arawakan a reasonable sample of languages will be adequate. In carrying out this type of investigation, one should bear in mind that at deeper levels of classification the same basic principles enunciated earlier still hold. Thus there is no reason to assume that Indo-European is necessarily a member of a stock with only two members any more than it proved to be the case for Germanic.

---

[4] That in principle this holds is shown by the interesting example of Arda in Colombia, listed as an independent stock in early classifications. Rivet (1925), guided by the resemblance of the name *Arda* to that of an important slave trading port in Dahomey, found that it was virtually identical to the Niger-Congo languages spoken in that area in West Africa.

It might seem that there is still a third method of classifying languages genetically, namely glottochronology. When it was introduced, of course, it was intended for another purpose, i.e., to measure the period of separation of related languages based on the assumption of a constant rate of change in fundamental vocabulary. In any specific instance, the date is derived from a count of shared cognates between two languages on the assumption of independent loss in both languages. In spite of its well-known weaknesses, it has been up to now the only reasonably objective method we have to accomplish this in the absence of written documentation.

However, it later began to be employed as a method of classifying languages genetically on the assumption that there was a lower limit of chance resemblance and that a significantly higher percentage indicated genetic relationship. Of course, viewed in terms of its original procedures, its use for this purpose, since cognate counts were involved, is circular. By definition there are cognates only when languages are already related.

This method bears a superficial resemblance to multilateral comparison, since it compares lexical forms in different languages and the data are often set forth in comparative tables similar to those used in the latter method, at least in its preliminary stages. The most important difference is that it employs pairwise percentages, thereby not taking into account the possible, multiple recurrence of resemblant forms across many languages by which the genetic groupings become evident. A great part of the evidence which connects related languages is in only one of the two languages compared and, it will be argued, in some instances occurs in neither. If, for instance, we were to compare English and Hindi directly, the percentage of cognates would be very low. However some of these would be recurrent over most or all of the other Indo-European languages and hence highly diagnostic. In other instances, English would show a cognate with, say, Slavic which was not in Hindi, while in other cases it would be Hindi that agrees with Slavic to the exclusion of English. These independent agreements of English and Hindi with Slavic are part of the evidence for Indo-European as a whole, as is, naturally, independent agreements of English and Hindi with still other branches of Indo-European. It could even be said that agreements between Slavic and Italic are relevant since they help to establish the overall family to which both English and Hindi belong.

Put syllogistically, English is a Germanic language; Germanic languages are Indo-European languages; therefore, English is an Indo-European language. Hindi is an Indo-Iranian language; Indo-Iranian languages are Indo-European languages; therefore, Hindi is an Indo-European language. Hence, English and Hindi are related.

To the weakness just discussed we may add that, as languages become more genetically distant over time, semantic changes occur so that items fall off the

comparison list, although they are still present as cognates. Thus English *hound* is cognate to German *Hund*, but *hound* will have been replaced by *dog* on the English list. We see then that glottochronology both excludes relevant evidence and weighs all items equally regardless of their wider distribution.

It will perhaps have been noticed that the occurrence of borrowings between languages as a possible source of error in genetic classification has not been discussed. I do not consider this a serious problem. This is true not only because, in most instances, it only tends to occur exclusively or mainly in non-basic vocabulary. Even when it occurs in a large part of basic vocabulary, there is a more fundamental reason why it can be detected. This has once more to do with multilateral comparison. Consider, for example, a language like Turkish with numerous Arabic loanwords. Outside of the rarity of these words in basic vocabulary, there is the fact that Turkish cannot be a dialect of Arabic because the two are mutually unintelligible. But Arabic is clearly Semitic. If Turkish is then related to Arabic, the words generally acknowledged to be loans will have to be reassessed as cognates and Turkish will be a Semitic language. But we may then ask why it shows no independence within Semitic. Whenever it resembles Semitic, the resemblance is to Arabic, which is thereby identified as the loan source.

A somewhat different sort of problem is presented by Quechua and Aymara which share numerous vocabulary similarities, many of them involving virtual identity of form. The question debated is whether all of the resemblances between the two languages are the result of borrowing, probably by Aymara from Quechua. If we consider the languages in isolation, it is difficult to reach a decision. However, they both belong to the Andean subgroup of Amerind, within which they do not form a special subsubgroup. The reason for believing that Aymara is related to Quechua is simply that they are both Andean languages. As such they show independent resemblances to other Andean languages. For example, an Aymara form not found in Quechua will occur as a cognate in Araucanian (another Andean language), while in other instances it will be a Quechua form not found in Aymara which has a cognate in Araucanian or some other Andean language. Note that it is not necessary to decide in every case whether a word common to Quechua and Aymara is a borrowing. Common membership in Andean is sufficient to show that they are related languages.

We now come to the last of the three questions raised initially, what was there called the justification problem. Nothing stated here in regard to this is intended to suggest that other kinds of classification are not legitimate and important; e.g., the significance of typological classification for the study of language universals. Nevertheless *qua* classification, genetic classification has a central position as indicated by the fact that it is the unmarked meaning of the term when linguists use the term

"classification" without further qualification. The basic reasons appear to be the following.

First, as compared to typological classification, it is unique in the sense that there can only be one correct one, whereas in regard to typology to ask which is the correct one is a meaningless question. The uniqueness of genetic classification is based, of course, on the fact that it reflects history, and history could have happened only one way. A by-product of this is the application of its results to culture history.

Areal classification is also important for history, but it assumes genetic classification as a basis and, as we have seen, the boundaries of linguistic areas are vague. We may sum up by saying that genetic classification is the only internal way of classifying language which is both unique and categorical.

It is, however, the importance of genetic classification as the point of departure for historical-comparative linguistics that linguists think of first if they are asked to describe its significance, and this is the reason it dominated the study of language in the nineteenth century. Most of what we know about the processes of linguistic change derives from the methodology associated with genetic classification, especially for areas without written records. This is, in fact, a further reason within the history of linguistics itself for the dominant position of the genetic model in language classification. During the nineteenth century there was only one form of typological classification practiced to any significant extent: that into isolating, agglutinative and synthetic languages. And this classification was further associated in a vague way with one into analytic, synthetic and polysynthetic. This form of classification, as compared with the genetic, did not prove to be fruitful, and, particularly with the advent of the Neogrammarians of the latter part of the century, was relegated to a very marginal position within linguistics as a whole.

There are several important relationships between these two modes of classification. One is in regard to typological sampling (Bell 1978). As far as possible in establishing implicational universals on the basis of typology, we wish to base the connection on historically independent cases, and, hence, considerations of both genetic and areal factors are important. There is a significant reciprocal value, however, for comparative linguistics deriving from typology in its diachronic aspect. The comparison of parallel typological developments in historically independent cases adds to our knowledge of diachronic processes, and thereby increases the scope of historical explanation and reconstruction.

Finally, we may note that the family tree model, by means of which genetic linguistic classifications are frequently represented, has analogues in a number of other fields, in some of which it receives a historical processual interpretation, and in some of which it does not. The logical structure of such trees is as follows. The individual

members form a set generated by a one-to-many relation, hereafter symbolized as R. There are certain further defining characteristics that are most conveniently stated in terms of a derived relation R^* (read "R-ancestral"). R^* is defined as any power R^n of R, by which is meant the repeated application of R n times. For example, if R is the relation of parent to child, R^2 is that of grandparent to child and R^* that of ancestor to descendant. We require that R^* be irreflexive and asymmetrical. A beginner in R is a member of the set to which no other member has the relation R. If there is a unique beginner, then all the other members of the set are in the field of the converse of R^*; that is, they all have the unique beginner as a common ancestor. In the case of language, if all the languages of the world are related this will be the case, and proto-sapiens will be the unique beginner.

There are many examples of the family tree model which do not have a historical genetic interpretation; e.g., stochastic processes such as the successive throws of a die. The most conspicuous instances in which a historical interpretation is generally accepted are languages and species in the theory of biological evolution. It is, of course, not the only alternative. Before 1859 creationism was the generally accepted theory in biology, while the Tower of Babel account was only gradually undermined in linguistics; by the early nineteenth century the historical interpretation of differential degrees of language difference was generally accepted. In the nineteenth century the similarities of evolutionary biology and genetic linguistic classification were recognized both by biologists and linguists.[5] Among the more obvious similarities are the correspondence of homology and analogy to genetic and typological resemblances. Again, the difficulty of distinguishing language from dialect is analogous to the difficulty of distinguishing species from variety.

In both cases there are conventional tests (mutual intelligibility in regard to language and the production of fertile offspring in relation to species), but in both instances there are borderline cases. This is because both speciation and language formation are dynamic processes. At a certain but not easily definable point, we have clearly distinguishable languages and separate species, and a point of no return has been reached. In language, however, we may have borrowing between separate languages. As far as I am aware there is no analogue of this for species, at least under natural conditions.

Examples of tree structures closer to language as objects of investigation are manuscript genealogies (stemmas) in which the relation of original to copy plays the role of R and the historical relationships of systems of writing.

---

[5] For a more detailed discussion of the methodology of classification see Greenberg (1957b, 1963, and 1986).

Since language is a cultural institution, it seems natural, in discussing cultural transmission, to ask if there is a more general cultural analogue to linguistic genetic classification. In attempting to answer this, it is useful to note that both in languages and in non-linguistic culture there are four basic sources of resemblance at the trait level. In language the classification into these four types applies whether we consider resemblances in sound only, meaning only, or sound and meaning simultaneously. However the illustration of these types will all involve sound and meaning.

The existence of these four types was apparently first noted in Pott (1855, p.42; repeated in greater detail in 1884, p.66f.), and for culture in Tylor (1865, pp.3, 376). Using more modern terminology than that employed by Pott, we may call these accident, sound symbolism, genetic, and contact (including borrowing). English examples of each of these are: English *bad* = Persian *bad* (accident); English *mama* = Savo (Indo-Pacific) *mama* (sound symbolism); English *foot* = German *Fuß* (genetic); English *chance* = French *chance* (contact by borrowing from French into English).

The general culture analogues of these are what Tylor calls independent invention (= accident), psychic unity (= sound symbolism), common inheritance (= genetic), and transmission (= contact). Independent invention arises because of the principle of limited possibilities. Since there are a finite number of sounds and a finite number of meanings, there are bound to be some accidental resemblances in language. Similarly matrilineal clans exactly the same in number have arisen in different ethnic groups in different parts of the world. Since in such cases the historical antecedents are likely to have been different in each case, this is sometimes called convergence by anthropologists. An example of psychic unity is the use of the crescent as a symbol for the moon in both Egyptian hieroglyphics and the earliest Chinese writing. Common inheritance is the likely source of numerous non-linguistic cultural resemblances among the indigenous cultures of the Polynesians deriving from the ancestral culture of the speakers of Proto-Polynesian. Examples of cultural borrowings are commonplace. A well-known anthropological example is the spread of the Ghost Dance religion among various groups of native Americans in the Western part of the United States in the latter part of the nineteenth century.

In cultural anthropology there was a long-continued debate in the first part of the twentieth century concerning diffusion versus independent invention as sources of cultural similarities. This debate was largely confused by the indiscriminate use of the term diffusion for both genetic (migration) and contact processes (borrowing). The concept of the *Kulturkreis* school in Germany and Austria was based on migration and in fact compared by some later members to genetic classification of languages; whereas in the United States during roughly the same period (1925-1955) the notion of the "culture area" developed on the basis of the spread of cultural traits by borrowing.

Genetic relationship with its branching representation is occasionally appropriate in culture history. For example the relationship among the various sects of the same religion may sometimes be conceived in this way. However, genetic relationship clearly does not have the same central position here that it occupies in language. For example, we would certainly say that Islam is far more similar to Judaism and Christianity than to Buddhism or Confucianism. However it arose through a single gifted individual who incorporated elements of both Judaism and Christianity with some of indigenous Arab provenience, and still others which were purely personal, to produce a new and unique synthesis.

The complex internal organization of language, which the average speaker is basically unconscious of, its fundamental and ubiquitous position in human culture, and its early acquisition and basic mode of transmission in family lines make it, so to speak, all of a piece. While the process of differentiation as shown in dialect variability can be reversed by standardization and softened by interdialectal influence, for the most part it proceeds inexorably so that ultimately forms as different as English and Armenian can have been derived from the same source. Moreover, the situation is favorable in language as contrasted with non-linguistic culture for detecting the results of the process of differentiation, as we have seen, because of the arbitrariness of the relation between sound and meaning and the existence of numerous independent elements exhibiting this relationship.

References

Bell, Alan. 1978. Language samples. *Universals of Human Language 1: Method and Theory*, ed. by Joseph H. Greenberg, 123-156. Stanford: Stanford University Press.

Collinder, Bjørn. 1960. *Comparative Grammar of the Uralic Languages*. Stockholm: Almqvist and Wiksell.

_____. 1965. *An Introduction to the Uralic Languages*. Berkeley and Los Angeles: University of California Press.

Greenberg, Joseph H. 1957. *Essays in Linguistics*. Chicago: Chicago University Press.

_____. 1959. Language and evolution. *Evolution and Anthropology: A Centennial Appraisal*. Washington: The Anthropological Society of Washington.

_____. 1963a. Some universals of grammar with particular reference to the order of meaningful elements. *Universals of Language*, ed. by Joseph H. Greenberg, 58-90. Cambridge: MIT Press.

_____. 1963b. *Languages of Africa*. Bloomington: Publications of the Indiana Research

Center in Anthropology, Folklore and Linguistics.

———. 1984. Some areal characteristics of African languages. *Current Approaches to African Linguistics*, ed. by Ivan Dihoff, 3-21. Dordrecht: Foris.

———. 1987. *Language in the Americas*. Stanford: Stanford University Press.

Guthrie, Malcolm. 1967-71. *Comparative Bantu.* 4 vols. Farnsborough: Gregg.

Masica, Colin. 1976. *Defining a Linguistic Area: South Asia*. Chicago: Chicago University Press.

Meinhof, Carl. 1932. *Introduction to the Phonology of the Bantu Languages*. Johannesberg, Berlin: Reimer/Vohsen.

Nerlove, Sara, and A. Kimball Romney. 1967. Sibling terminology and cross-sex behavior. *American Anthropologist* 69:179-187.

Pott, August Friedrich. 1855. Max Müller und die Kennzeichen der Sprachverwandschaft. *Zeitschrift der Deutschen Morgenländischen Gesellschaft* 9:405-464.

———. 1884. Einleitung in die allgemeine Sprachwissenschaft. *Internationale Zeitschrift für allgemeine Sprachwissenschaft* 1:1-68.

Rivet, Paul. 1925. La langue arda ou une plaisante méprise. *21st International Congress of Americanists*, *Proceedings* 11:1-20. Goetherborg: Goetherborg Museum.

Sainovics, Janos. 1770. *Demonstratio idioma Ungarorum et Lapponum idem esse*. Copenhagen: Press of the Royal Orphanage.

Szinnyei, Joszef. 1910. *Finnisch-ugrische Sprachwissenschaft*. Leipzig: Göschen.

Tylor, Edward B. 1865. *Researches into the Early History of Mankind and the Development of Civilization*. London: J. Murray.

Wang, William S-Y. 1969. Competing changes as a cause of residue. *Language* 45:9-25.

———(ed.). 1977. *The Lexicon in Phonological Change*. The Hague and New York: Mouton.