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ABSTRACT

One of the first problems concerning research in the languages of Oceania is that the number and location of languages there is not precisely known. Another problem is determining just what a language is. Appell's "isoglot" may be a better method of distinguishing different languages than "mutual intelligibility." The Oceanic area is "arbitrarily" defined here to include the Australian, Papuan, and Austronesian languages. The number of languages in aboriginal Australia is over 200. All appear to be related, with approximately two-thirds of the continent originally occupied by languages of a single sub-group, Pama-Nyungan. The remaining sub-groups are in the northwestern part of the continent. No language relationships outside Australia have been established. Greenberg has presented a detailed argument for a genetic grouping of the Papuan languages (noted for their great diversity), including the languages of the Andaman Islands, the extinct languages of Tasmania, and at least most of the Papuan languages. The Austronesian family is distributed among a considerable number of different political entities. There is still no general agreement on the earliest branching of Proto-Austronesian. The author comments on some typical features of these language groups. (These Working Papers constitute progress reports and are preliminary in nature.) (AMM)

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LANGUAGES OF OCEANIA*

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I have had some difficulty in deciding how I should approach the present task. More specifically, what kind of input from a particular linguistic area can be useful for the objectives at hand?

It seems to me that the overall task is that of selecting the kinds of linguistic facts that should be reported with regard to each language. In a general way, it seems obvious that what we should attempt to do is provide answers for the questions linguists will want to ask. That is, of the set of possible true statements about a language, we want to select just those that can serve as answers to linguists' questions.

But where can these questions be found? If practical considerations could be laid aside, the ideal answer would seem to be: In the linguistic theory of the future. By "linguistic theory" I just mean any source of questions whose immediate purpose is to advance our understanding of the nature of human language. However, we have no supernatural means at our disposal, and must, therefore, base our decisions on present day linguistics. The distant future is very difficult to anticipate on any basis, but it would seem that the principal basis for projecting the linguistic theory of the near future is the linguistic theory of the present. That is to say that it seems the questions we should seek to get answered should derive in the main from general theoretical interests rather than the more parochial interests of the area specialist.

When the matter is seen in this light, what kind of contribution can the area specialist attempt to make? It has seemed to me that what I should attempt primarily to do is call attention to problems arising in the

area which might eventually prove to be of greater interest to general linguistic theory than has so far been recognized. That is not an easy task, of course.

In what follows, I will make a few remarks about the problem of identifying the objects for description in the Oceanic area. Then I will give a few brief indications regarding directions taken by current linguistic research in various parts of the area, and finally, mention some problems that may be of general interest.

One of the first facts which confronts us with regard to Oceania is that we do not know very precisely just how many languages there are and just where they are. This immediately poses the problem that we do not have a definition of the set of objects to be described (i.e., all of the languages of, in this case, Oceania). The problem has two aspects. In some areas our information is very spotty. This is the case for much of Melanesia and eastern Indonesia and for limited portions of other areas (e.g., much of Borneo). Even here it appears that we probably have some information (e.g., at least a short word list) for most of the distinct languages in the area, but there is often considerable uncertainty as to just what part of the map a given list corresponds to. The informant's village often has not been identified, but even when it has, we generally do not know what other villages have the same language.

Although I said we probably have some information on most of the languages, I would not like to make the mapping problem appear trivial. In my experience when we are able to obtain first-hand information on the linguistic situation on a particular Melanesian island from some one who has been there, it quite frequently turns out to be significantly different from anything it would have been possible to imagine from the information in the public domain.

Some years ago I was thinking a bit about how the problem of describing the Melanesian languages might be realistically approached. It seemed to me at that time that it would be desirable to divide the field work into two or more stages. The first stage would be concerned with completing the mapping. The case (or part of the case, at any rate) for the mapping would be based on linguistic facts obtained at least in part in the field. It would be one of our objectives to see that the facts so obtained would be sufficient to identify representative objects of description for the next stage. The next stage would consist in more intensive description of the languages chosen. Ideally, perhaps, every truly different language would be described in this stage (perhaps in some cases the description might actually encompass only a single dialect which appeared to be an acceptable representative of the language as a whole). However, I had imagined that the resources might not be sufficient to permit a more intensive description of every language. In this event, I had supposed that we would be able fairly successfully to identify groups of languages which were sufficiently similar that their principal characteristics might be rather satisfactorily represented by a good description of a single language in the group. Finally, I had imagined that we might want still further stages in which particularly significant problems in a small selection of languages might be pursued in great depth.

Whatever the merits and feasibility of the sort of scheme I have outlined, I do believe that the best use of the resources available should involve (1) some kind of description of every language, and (2) description in greater depth of a representative sample of languages, and perhaps the latitude to pursue in exceptional detail phenomena which appear to be of particular significance for our understanding of human language.

The second aspect of the problem of defining the set of objects to be described is that of determining, assuming that all relevant facts are available, just what is a language. I have in mind here the problem of language and dialect. In the case of Polynesia, one extreme view holds that all Polynesian languages ("languages" in the usual parlance) are in reality dialects of the same language. However, this view would be hard to justify in terms of the usual understanding of the notion "dialect". Bruce Biggs in his contribution to volume 8 of Current Trends in Linguistics (Biggs, forthcoming) states that there are probably at least fifty Polynesian communalects sufficiently different to be distinguished linguistically. He groups these (forthcoming, 59), "on the basis of what is known about mutual intelligibility and structural and lexical similarity, and on what I regard as some kind of consensus of opinion among a number of people with whom I have had discussions", into 25 languages. However, he later comments (forthcoming, 60), "probably no one will agree entirely with my grouping."

A somewhat different problem is represented by the so-called "Trukic continuum" in Micronesia. The Trukic continuum (cf., e.g. Bender forthcoming) is a chain of communalects, extending approximately 1500 miles from one end to the other, such that no two neighboring communalects can apparently be assigned to different languages by any of the more familiar criteria, e.g., cognate percentages of mutual unintelligibility. Yet it does not seem satisfactory to treat the most diverse members of the continuum as dialects of the same language.

Such problems are not peculiar to Oceania, of course. Neither the expedient of an independent ad hoc solution for each case or that of an arbitrarily contrived general criterion is very appealing. If, indeed, there

is a more satisfactory solution to be found, the best approach to finding it would seem to involve some clarification as to what it is that we want to discriminate.

The kind of relationship that typically exists between dialects of the same language and the kind of relationship typically found between distinct languages appear to differ significantly in several ways. Mutual intelligibility--that is, the distinction between those communalects (or idiolects or whatever the prime is) that enable their speakers to talk to one another and those that do not--generally appears to be regarded as the basic consideration. However, mutual intelligibility is perhaps tacitly thought to guarantee that there is no significant linguistic difference between the units being compared.

Again, we have the idea that different languages (as contrasted with dialects of the same language) are irreversibly distinct entities with respect to subsequent linguistic change. There is in this sense a remarkable analogy between the variety-species distinction in biology and the dialect-language distinction in historical linguistics. Whatever the historical connections, if any, between these conceptualizations, the absence of mutual intelligibility has seemed to function as some sort of conceptual equivalent of the breeding barrier of biology.

All of these matters are complex. Mutual intelligibility, in addition to the fact that it is a matter of degree rather than an either/or proposition, doubtless depends on such further considerations as individual aptitude, linguistic experience, and social psychological factors. The effectively independent units with respect to potential for linguistic change likewise are presumably not identifiable by any simple test of linguistic homogeneity. Perhaps a better candidate as such a unit would be what

Appell (1968:13) calls the "isoglot". This he defines as the speech "of a group of people who consider their language or dialect to be significantly different from neighboring communities and thus have an indigenous term by which to identify it", thus, "of a self-conscious speech community". There would undoubtedly be some difficulties in applying such a concept universally. I am not prepared to guess how easily they might be surmounted.

I will now attempt to give a brief account of the principal directions and interests of current research in the Oceanic area. I have arbitrarily defined the area as including the Australian, Papuan, and Austronesian languages, although in so doing I am straining at the limits of my competence. It seems fairly natural to consider them in the following order: Australian languages, Papuan languages, Austronesian languages in general, and finally, the languages of particular areas within Austronesian.

In Australia what are often referred to as "depth studies", i.e. the description in depth of a single language, are still few in number. However, more limited information has been collected for a considerable number of the languages. Estimates place the number of languages in aboriginal Australia at over 200. All of the languages appear to be related, with approximately 2/3 of the continent originally occupied by languages of a single subgroup, Pama-Nyungan. The remaining 25-30 subgroups are congregated in the northwestern portion of the continent. No relationships with languages outside Australia have been established.

Linguists have commented on the existence of relatively widespread typological similarities. Phonological features that are often mentioned include three-vowel systems, a sin le stop series (no contrast of voicing), the proliferation of apical points of articulation (often three, in addition to a laminopalatal), and the rarity of fricatives.

The languages are typically agglutinative, with suffixation particularly common. In fact, the typological contrast between the majority of the languages which employ only suffixation, and a small group in the northwest which employ prefixation as well, has attracted considerable attention. So also has the contrast between languages showing an ergative and those showing passive verb forms. Some of the languages in the northwest have systems of noun classes with concord.

Comparative reconstruction and genetic classification are hampered by the limited numbers of identifiable cognates. This has attracted particular notice where (especially in the south) the cognate percentage between remote dialects of the same dialect chain is low, or (especially in the north) when languages which are strikingly similar typologically show extremely low cognate densities.

The term "Papuan" was originally introduced to designate those languages of New Guinea and islands to the east and west that were not members of the Austronesian family. The Papuan languages were noted for their great diversity, and it was supposed that they would ultimately prove to constitute a large number of separate language families. However, as research progresses the existence of wider relationships has become increasingly evident. Joseph Greenberg has presented a detailed argument (Greenberg, forthcoming) for a genetic grouping including the languages of the Andaman Islands, the now extinct languages of Tasmania, and at least most of the Papuan languages.

The bulk of the recent field research has been carried out in Australian New Guinea by linguists of the Australian National University and the New Guinea Branch of the Summer Institute of Linguistics. In spite of what has been relatively large-scale linguistic activity, the great number of languages and their great diversity make it difficult to give any concise summary of salient characteristics. However, I will mention a few points which may be suggestive.

With respect to phonology, I may note the frequent existence of phonemic tone, and the occasional presence of labiovelars and prenasalized stops. Some languages have velar stops with lateral release. I am also struck by the pattern of phonemes with allophonic ranges extending over stops and continuants in some languages.

It is difficult to discover valid generalizations about the grammar of Papuan languages. However, several writers have commented on the common occurrence of the subject-object-verb word order. Some further suggestions are provided by the criteria used by Capell (1969) in his classification of Papuan structural types. His principal criteria are the presence of noun classes and the presence of various elaborations of the verb. The latter include (1) the incorporation of subject and object markers in the verb (sometimes indicating only number, sometimes person, and sometimes noun class as well), (2) the incorporation of adverbial elements, and (3) the distinction of sentence-medial and sentence-final verb forms. The last-named distinction involves different sets of affixes for the final verb of the sentence and a verb which precedes it. It is perhaps accurate to think of the sentence-medial verb as subordinated to the final verb in some sense. Verb morphology becomes extremely complicated in some languages.

As could be expected from its extensive geographical spread, the Austronesian family is distributed among a considerable number of different political entities. Although a number of genetic groupings can be more or less clearly discerned, there is still no general agreement on the earliest branching of Proto-Austronesian. These circumstances have resulted in the development of a number of more or less independent research traditions, based on different combinations of political and linguistic factors.

Although it is difficult to make generalizations that will not encounter an exception somewhere in a family embracing so many languages, I believe the following are fair statements concerning "typical" Austronesian characteristics. The phonologies are generally not very complex either as regards the allophonics or the morphophonemics. The canonical forms are relatively simple. Proto-Austronesian apparently permitted certain clusters of two consonants in medial position. Some clusters may also have occurred in word-initial position through prefixation. Languages in the western part of the Austronesian area typically retain similar patterns. Languages in the east have typically eliminated all consonant clusters. Vowel sequences are rare in the languages in the west, but are more common in the east. However, there they generally result from the disappearance of intervening consonants. Lexical morphemes are most often two syllables in length.

Proto-Austronesian appears to have had a four-vowel system, and systems of not more than five vowels remain common. Five vowel systems may be regarded as typical in the east, but some languages have developed considerably more complicated systems--often including a series of central (or occasionally back unrounded) vowels.

The Proto-Austronesian consonant system still presents many problems. There seem to have been distinct series of voiced and voiceless stops. This distinction is generally retained in the west but lost in the east. There may have been no, or very few, fricatives. There was apparently a considerable number of distinct points of articulation in the apical-laminal area, although the details are unclear. Prenasalized consonants have developed in the east, apparently through rephonemicization of clusters. Labiovelars also appear in a number of eastern languages. In general, eastern consonant inventories are smaller than those of the west, primarily as a result of phonemic merger.

Verb morphology assumes moderate complexity in some languages in the west, although identification of the component morphs is generally easy. The morphology is noticeably simpler in the east. Pronoun systems show some elaboration. There are often different sets for different grammatical slots, and in the east, three, four, or even more numbers are sometimes distinguished.

I will now comment briefly on current research interests in some of the Austronesian subareas. Polynesian is a well defined linguistic subgroup. Some information is available on all of the languages, with a reasonably good sample fairly well known.

Polynesian languages have five-vowel systems and quite limited phonemic inventories. All syllables end in a vowel, and there are no consonant clusters except for geminate clusters in a few languages. The phonology and morphophonemics are consistently simple, although there are still some relatively inconspicuous problems awaiting adequate solution.

The morphology is also very simple. However, there are a considerable number of frequently recurring minor morphemes. Most of these are free forms, but some morphological combinations of minor morphemes occur. Consequently, both the noun phrase and verb phrase assume some complexity. Indeed, discussions of the structure of these phrases are somewhat reminiscent of discussions of word morphology in other languages. Recent research interest has been largely directed toward syntax. Syntactic research has been going on at Auckland, Hawaii, San Diego, and M. I. T., but it is still essentially of an exploratory nature, and it is difficult to pinpoint phenomena of particular interest. One matter that has received particular attention is the ergative-accusative distinction (or better, continuum, as some languages seem to be in a transitional stage).

Most of Micronesia is occupied by languages belonging to a single subgroup, often referred to as "Nuclear Micronesian". Research carried out during the past few years, particularly at the University of Hawaii, has significantly advanced our knowledge of Nuclear Micronesian. These languages are rather atypical, at least phonologically, in terms of the general Austronesian characteristics outlined above. The phonologies are quite complex, and as phonological descriptions have become more sophisticated, they have tended toward more abstract phonemic representations. Bender 1968 gives an excellent account of this evolution with regard to the description of Marshallese.

The morphology likewise appears to present some problems. However, syntactic research is still in an exploratory stage of development, and it is impossible to foresee what phenomena of particular interest will come to light.

A good summary of phenomena which are common to most Nuclear Micronesian languages is given by Bender (forthcoming, 86-7). His enumeration is as follows: "velarized consonants, double consonants, vowel assimilation, elaborate demonstrative systems correlating with person categories, classification of nouns by both numerals and possessives, verb phrases introduced by subject prefixes and having numerous pre-verbal tense-aspect orders of particles, reduplication of several varieties fulfilling several grammatical functions--including a category that might be termed 'distributive'."

It should be pointed out that although there are undoubtedly differences in detail, phenomena corresponding in a general way to each of the above are to be found elsewhere among the Austronesian languages, particularly in the east.

There is no general agreement as to the position or positions of the so-called "Melanesian" languages (i.e., the Austronesian languages of Melanesia) in the Austronesian family tree. However, there would be fairly general agreement that the languages included under that rubric are a much more diverse collection than either the Polynesian or Nuclear Micronesian groups. With the possible exception of Fijian, none of the Melanesian languages is as well known as the best known languages of Polynesia and Micronesia, and the area as a whole is not nearly as well surveyed. There has been nothing that could be described as a concerted effort directed toward the area as a whole. However, there do not appear to be any distinctive phenomena typical of the entire group of languages that differentiate them from the Polynesian and Micronesian languages just mentioned.

All of the languages of the Philippines clearly belong to the same subgroup of Austronesian, although the subgroup includes at least a few languages spoken elsewhere. The bulk of recent research on Philippine languages has been carried out by members of the Philippine Branch of the Summer Institute of Linguistics, but other linguists, both Filipino and American, have contributed.

As in the case of the Polynesian languages, phonologies have seemed simple, and have attracted relatively little attention. Most languages have CV and CVC syllable structures. Most have systems of four vowels, one being a central vowel, or of five. The consonant systems usually show contrasting series of voiced and voiceless stops. In general, there is nothing particularly exotic about the phonologies.

The phenomenon that has attracted the greatest attention is the system of voices of the verb. Early writers were already commenting on the prominence of passive constructions in these languages. In fact, the so-called "passives" are of different kinds according to the underlying case (as it has been called) of the nominal expression selected as the subject (or in current terminology, the "topic"). Typically, there are four relevant cases--actor, goal, referent (either a beneficiary of, or the location of, the action), and instrumental. The constructions which have been called passive are those where the nominal expression that serves as the topic represents any of the cases other than the actor. In the current view the verb is seen as appearing not in just two voices, active and passive, but in four--actor, goal, referent, and instrumental.

Verbal affixes indicate the voice of the verb. In so doing they simultaneously specify the case of the topic nominal expression.

The system as I have outlined it is actually fairly simple. However, it appears that there is a rather elaborate subcategorization of verbs in

terms of the particular cases they require or imply and of the voices in which they are able to appear. These problems of subcategorization are currently receiving increased attention.

Verb structure is somewhat more complicated than the previous discussion has indicated. There is also affixation for tense, aspect, and mode. Moreover, there are causative prefixes which have the effect of producing a new, derived verb stem with its own system of combinatory possibilities. In general, then, in Philippine languages, the verb seems to be where the action is.

The remaining areas occupied by Austronesian languages are Madagascar, parts of Formosa, the Southeast Asian mainland areas occupied by the Chamic languages, and the area comprising Malaysia and Indonesia. In the case of the first three, the number of languages involved is relatively small, and the available information does not add significantly to the phenomena that have already been mentioned.

The Indonesia-Malaysia area is certainly of importance. However, current research efforts are limited in quantity and largely uncoordinated. Neither recent nor earlier works are of a nature to facilitate generalizations about the languages of the area. A few of the languages belong to the Philippine group. Most of the rest seem distinctly more similar to the Philippine languages than to the Austronesian languages farther to the east. However, the languages of the eastern part of Indonesia--the Moluccas and a part of the Lesser Sundas--seem rather different. There has never been sufficient field research in the area, but there have been various suggestions that these languages are in some way transitional between the languages to the west and those to the east. Two points in which they are supposed to differ from the western languages are word order and what may be a basically different kind of verb morphology. They certainly appear to merit more systematic study.

As a final topic I would like to talk briefly about some problems that come up in historical research. An important part of the research effort in Oceania has been directed toward historical ends. There are probably some interesting insights to be derived from patterns of phonemic change. I am puzzled, for example, by the frequency of shifts of t to k in eastern Austronesian languages. However, the principal problem that I want to discuss here is that which comes up in attempts to arrive at satisfactory genetic classifications.

Otto Dempwolff remarked (1934:13) that the Austronesian languages did not have the kind of uniform grammatical structure that is found in some language families, whereas they did have an extensive shared vocabulary. However, there are areas within the whole--Melanesia perhaps provides the most conspicuous examples--where the opposite condition seems to obtain, i.e., relative grammatical uniformity accompanied by lexical diversity. It may be recalled here that comparable situations in Australia were mentioned earlier.

Any statements about Austronesian grammatical typology must, for the present, be quite impressionistic. However, some more or less widely shared impressions can be found. A comparison of such impressions with Isidore Dyen's (1965) well-known lexicostatistical classification of the Austronesian languages clearly suggests that similarity of grammatical structure is not always associated with a corresponding degree of lexical similarity. However, Dyen's classification also appears to be fundamentally incompatible with any classification based upon the sound correspondences as they are now understood.

I think there may also be indications that similarity of grammatical structure will not accord perfectly with genetic groupings as determined by sound correspondences when these have been worked out in sufficient detail. It is impossible to say anything very precise about this question at present. However, as an example, it has been suggested that there is a distinguishable sub-type of Melanesian structure in the New Guinea area. I have already mentioned previous suggestions that the languages of eastern Indonesia represent a distinguishable sub-type within Indonesia. In both cases, the influence of Papuan language structures has been proposed as the source of the structural peculiarities in question.

It is hard to avoid the conclusion that language contact has played a significant role in the history of many of the languages of Oceania. In fact, it has often served as a sort of deus ex machina which can be arbitrarily invoked to resolve any problem. Linguistics in Oceania, at least, is in serious need of a theory of linguistic change that will provide a basis for formulating and evaluating hypotheses which specify in some detail the nature of the proposed contact and the resultant linguistic changes.

It seems unfortunate that many writings in linguistics have appeared to suggest that the only significant changes in a language that can be attributed to its contact with another language either consist in, or ultimately result from, vocabulary borrowing. However, recent work (Gumperz 1967 is a particularly striking example) has effectively re-opened the question. The new approach that I seem to discern would regard linguistic change as a kind of microevolution, in which the change is responsive to a variety of selective factors[1] stemming from the total environment. By "total" environment, I mean a conception of the environment that would embrace simultaneously the natural, cultural, and social (including the social psychological) aspects.

Perhaps I can indicate what I have in mind with some speculative remarks directed at some of the problems discussed above. It seems that we probably need to identify mechanisms to account for two kinds of results: (1) accelerated vocabulary divergence, and (2) convergence of grammatical structure.

With regard to the first, I have heard informal suggestions that in some Melanesian areas, observable linguistic differences may be valued as "emblematic" (the term was suggested to me by Ted Schwartz) of different social groups.[2] If such an emblematic function was all that was being selected for, then simple vocabulary differences--different words for the same thing--seems sufficient to meet the requirement. This kind of minimal difference--same concepts, but different labels--would seem adequately to satisfy our notion of different languages while at the same time posing the minimal obstacle to communication. [In this connection it is interesting to note the expectation, apparently widespread among those who are sufficiently naive linguistically, that differences between languages will be precisely of this sort.] In any case, if such a selective process were actually operating for any significant time span, it could have a marked effect on lexicostatistical measures of relatedness.

I am not aware of any very specific suggestions as to a mechanism leading to grammatical convergence. However, one matter that I would expect to be significant in any case of extensive and prolonged contact between languages is that of ease of communication. That is, I would expect a universal tendency to select those changes which would tend to facilitate communication. However, this tendency would, of course, interact with the other selective factors in the situation, and might conceivably be completely offset by them. I have suggested that vocabulary differences in the sense of differences of labels constitute an obstacle--but a minimal obstacle--to communication. More sophisticated, and I believe

onerous, demands are placed on the speakers when the difference involves more than the labels. I am thinking, for example, of the cases where we say a given word in one language has no "exact equivalent" in the other, where we cannot adequately translate a word without taking into account its context. We might even think of ease of communication as an inverse function of the quantity of context required on the average for the adequate translation of a word. However, I do not intend to recommend that anyone undertake the chore of developing this suggestion into a workable measure.

I think, in fact, that it is misleading to speak of the matter simply in terms of vocabulary matching. It is more generally the problem of how something is, or can be, said in each language. It is the problem of how a particular message is, in Greenberg's (1959:74) apt phrase, "analytically specified" in a sentence or sentences of each language, with the meanings of words only one aspect of the problem.

Whorf has given a number of examples (e.g., cf. Carroll 1956:208, 235, 243) to illustrate extreme differences in the way a message is analytically specified in English and one or another American Indian language. To be a bilingual in a situation such as Whorf evokes would seem to be a quite schizophrenic experience. One would imagine that a group of bilinguals would find it difficult to do much code-switching within the confines of a sentence, that translating would pose real challenges, and that good simultaneous interpretation would be a tour de force.[3] On the other hand, Gumperz's (1967:53-5) Kannada-Marathi example seems to represent a case in which a remarkable degree of compatibility in just this respect has been achieved between two languages belonging to different families.

I might sum up the point I have been trying to make as follows: (1) language contact seems to have been an important factor in the linguistics of Oceania, (2) there appear to be some hopeful signs that a general theory of linguistic change broad enough to include the effects of language contact is possible,[4] and (3) since William Labov has shown us that ongoing linguistic change is a factor in the synchronic situation, we should make a systematic attempt to make the relevant observations in the field.

Perhaps all that it is appropriate to say by way of conclusion is that linguistics in Oceania is still to a large extent in an exploratory stage where many of the problems are of a very general nature.

NOTES

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[1]A theory based on selection of course presupposes a source of variation. A certain amount of variation--enough, it would appear, to provide a starting point--is already available in any language. However, I am sure that additional variation is potentially present and I imagine some such variation becomes overt under the stimulus of the contact situation. It would be of interest to know just what sort of limits there may be on such possibilities. I would imagine that virtually any kind of calquing could be achieved as the long run result of a sequence of changes. However, there might be fairly clear constraints on immediate changes.

[2]Interestingly Fernando Nottebohm (1970) has suggested that the evolution of plastic vocal ontogenies (i. e., such that some of the details of the song are acquired by learning from other members of the population) in some kinds of birds probably subserves just this evolutionary function--to mark different populations by distinctive song dialects. Here, of course, it is the biological breeding populations that are of interest.

[3]I think, by the way, that the average layman would have no difficulty in accepting Whorf's view that the differences we are discussing are differences in thought rather than just differences in the way the thought is reported. I think Whorf's examples do involve some aspects of the complex set of phenomena that we ordinarily refer to as "thought". Possibly, when these phenomena are better understood, we will want to reserve the designation "thought" for a more limited subset. However, the label is not important. Whorf has shown us where a boundary can be drawn. I do not see, for example, that its validity depends on our demonstrating that the two kinds of differences are independent in the sense that two languages can show one kind of difference without any instances of the other kind.

[4]I have not said anything about the role of language contact in phonological change because I do not imagine it often affects the evidence for earlier sound changes except in an incidental manner. However, phonology is certainly not immune to the effects of other languages.

What I think I have observed in a number of instances where languages have been in prolonged contact is a tendency toward a matching of the pronounced segments. That is, toward the condition where most of the segments that occur in utterances in one language are phonetically very similar to particular segments that occur in utterances in the other. What I have imagined was happening was a selection for changes that tended to reduce the kind of "gear-shifting" phenomenon we typically experience in switching from one language to another, for example, when pronouncing an unassimilated foreign word in a native utterance. I would expect these selective factors to affect the permitted sequences of sounds and the "articulatory base" (whatever that is).

As regards both phonology and grammar-plus-lexicon, I have in mind the following assumptions. (1) Some kind of abstract basis for making interlinguistic identifications is involved. In the case of phonology, this would mean the identification of a sound in the other language as a different pronunciation of, but somehow the same sound as, a particular sound in one's own language. In the case of grammar-cum-lexicon, it would mean the identification of translation equivalents. (2) Selection would directly involve only phenotypic expression, although structural consequences would often ensue. (3) One kind of selective factor that would always be present, although its effect might be overridden by other factors, would be the factor of inter-language compatibility.

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