

REVIEWS

FOUNDATIONS OF LANGUAGE. By LOUIS H. GRAY. Pp. xvi + 530. New York: Macmillan, 1939.

This book sets out to review the subject-matter and results of linguistics, as well for the general public as for the technical linguist. The author deals with the nature of language, with phonetics, morphology, and etymology, and with the classification of languages. Among the finest features of the book are the chapter on the historical method of etymology, and the two useful and detailed chapters classifying genealogically the languages of the world. However, in spite of Professor Gray's unquestioned competence as a linguistic worker, the value of the book is vitiated, especially for the layman, by a major shortcoming. This is the neglect of the method of structural analysis, i.e. of organized synchronic description. As a result, many of the facts about languages are misconstrued, and linguistic theory is distorted. It is the chief purpose of this review to show that an appreciation of linguistic structure is necessary for any interpretation of linguistics, and that its neglect leads to undesirable results in practice.

From the very start, neglect of synchronic structure cuts a linguist off from most of his data. Gray says: 'linguistic method must be essentially historical in its assemblage of material' (1). As a result, he cannot deal linguistically with material which cannot be historically traced: 'In . . . the American Indian languages . . . the data are too meagre to afford a basis for more than the most tentative of interpretations' (2); this in spite of the fact that data for structure and comparison are as available here as elsewhere. In listing the linguist's sources (141), he speaks only of literature and written materials of earlier times, and fails to mention ordinary conversations (which he mentions on p. 226), a slip made possible only by a denial of the value of synchronic description. This stressing of written sources is the more regrettable, as the data for speech not only are more direct, numerous, and normal, but also have greater laboratory value, since in speech we have opportunities for controlled observation, and even for experimental conditions (as in the creating of test forms to check the productivity or classification of a process).

In the interpretation of his data, neglect of the structural method cuts the linguist off from the organization of all non-historical facts. The author sees only the historical interpretation: 'It becomes necessary to be thoroughly versed in the history of each language before one can render a scientific judgement upon any of the phenomena which it presents' (2); the 'method of procedure [of linguistics] is essentially the same as in investigation of any problem of history' (4). To get the real meaning of words, therefore, we must know not only how they are used, but also their history: 'If the student of literature . . . is ignorant of the historical development of words and their arrangements, . . . he sunders himself from that which will give him a keener appreciation of literature' (142). And of the syntax of a language at various periods: 'The later period is seldom fully intelligible without knowledge of the earlier' (226). Such appeals to history are beside the point, since the meaning of forms and of their arrangements is necessarily given by a complete description of how they are used, i.e. of what they mean to the people who use them.

The practical results of this position appear throughout the book. Some interpretations are historical: the proof that in nominal sentences we do not have an omission of a copula is that 'originally there was no such thing as a copula' (230). Others are comparative: 'Phonology, morphology, and etymology may be studied with fair adequacy with the help of tables of sound correspondences' (226; there is no hint that these may be studied by themselves as systems in a single language). Still others are semantic: 'The sentence consists essentially of two parts. . . . Sentences containing only a noun, such as *fire*, *murder*, are really elliptical and require a verb to make their meaning complete, *there is*, *is being committed*' (228-30). Such explanations are necessarily irrelevant, and may lead to incorrect analysis, as in the last example cited. The structural relations are clouded. Elements are accounted similar or different according to their original state: 'Grammatically, nouns and adjectives are identical; their functional differentiation . . . was a later development' (169); 'In Indo-European . . . the pronoun for the third person is, in reality, a demonstrative' (173); 'Outward identity of form does not necessarily imply essential and historical unity' (2), so that homonyms of different origin are considered descriptively separate, even if they would now be the 'same word' in the speaker's judgment. 'The Latin ablative has three general connotations: "from", "with", and "in"; they are irreconcilable so far as Latin alone is concerned. If, however, we compare Latin declension with Sanskrit, we find that the

Latin ablative is a combination' (19-20). But for Latin this is a single morphological relation, not three irreconcilable ones. The division into three is merely what a Sanskrit or English speaker would find in Latin (though an English speaker might well find some other division, since the one above is not based on any category of his language); it reflects nothing in the Latin language. Insofar as any parts of utterances in a given language have the same form, and are used in the same way in respect to the other parts, they are necessarily identical in any sense which we can investigate.

Failure to organize data by their place in the structure often leads to unsatisfactory classifications. Thus we find the verbal prefixes of Semitic (*hi-*, *ta-*, etc.) mentioned together with root determinatives (Arabic *na-* in *našara*, also IE *-ent-*, *-tor-*, etc.; 156-8); but the former can be used with almost any verb, are members of a closed contrastive set (category), and exist not by themselves but only in conjunction with certain vowel patterns, while the latter are ordinary and non-contrastive suffixes, each limited to a few particular roots. Translated words are called foreign (132) even if they have been formed in accordance with the structural processes of the language; no indication is given that a word like Ger. *übersetzen*, though it would be regarded as a translation in a study of inter-language contacts, is structurally indistinguishable from other German words. Lack of structural analysis thus enables the author to call some scientific terms 'linguistically correct, both elements being drawn from the same language', while others are 'linguistically unjustifiable, whose components are taken from different languages' (148). One need hardly point out that for the speaker it makes no difference if the elements come from one language or two, but only if the phonological and morphological structure of the form is the same as that of other words in his language. The difficulties of classification come out clearer when, after describing genders, Gray mentions the Bantu classes, saying: 'It is not quite certain whether these classes can properly be termed genders' (190), though the Bantu classes differ in important respects from IE genders, and can only be described in terms of their structural position in Bantu. Similarly, Gray looks upon case as being not a grouping of morphological relations in a language, but something existing of itself: 'We may reckon the number [of case-forms] as at least thirty-six, of which IE has eight' (191). But the only number of case distinctions which can be listed is the largest one observable in any particular language (much below 36). To list a series of case significations is arbitrary and useless, for every language

covers all the noun relations that exist in its utterances. The inessive of Finnish is partly or wholly equalled in the locative of Latin or the genitive of Arabic, so that these three cannot be added to each other in this list; on the other hand, the accusative or genitive of Latin and of Arabic cover different functions, and cannot be equated and counted as one in the list. The author ascribes 'one [case] each to Modern French, Italian, Spanish' (191). But one case is no case; if the formal relation of nouns to other words is the same for all nouns in that language, then it is pointless to set up a class of nouns having that relation (case).

In view of all this, it is not surprising that no adequate statement of phonemic analysis appears in this book. The nearest we come to it is this: the speaker 'normally hears (i.e. specifically recognizes) only those individual words or sounds which he feels necessary for understanding the force of the sentence collectively' (225). Disputed interpretations of the phoneme are mentioned (61), but there is no indication that, whatever the interpretation, all linguists use it in much the same way. Phonemes are used because every language can be most conveniently described in terms of a number of such units; but this is a result of structural analysis, and does not emerge here. The further result, that certain linguistic events can be described as determined by phonemic structure, is also omitted. Thus, in describing the difficulty of pronouncing foreign sounds (5), there is no mention of the interference of the speaker's native phonemic habits. In speaking of the 'effect midway between voiced and voiceless' which voiceless lenes make on 'the unaccustomed ear' (51), what is meant is an ear accustomed to voiced lenes and voiceless fortes. The author arranges sounds according to length, sonority, etc., and gives such rules as that short vowels become shorter yet before voiceless consonants (57-60), without indicating that in the phonemic structure of any given language only certain of these phonetic differentiae and habits (rules) are significant, while others don't exist or are non-distinctive. There is also no discussion of phonemic distribution, i.e. of the various positions in which each phoneme may occur, the absence of phonemic contrasts in certain positions (neutralization), etc. Morphophonemes are omitted, presumably so as not to complicate the account, although they or their equivalent are necessary in any discussion of linguistic regularity. These omissions were possible only because the author did not consider the existence of a phonologic structure in each language.

Neglect of structural analysis of each language leads to disregard of the differences between language structures. This is true even of

the different structures of successive periods of the same language, as when Gray says 'Hebrew usually has the Arabic word-order' (239), which was true at one period of Hebrew, but not at another. Gray is quite aware of the principle that each language should be 'judged on its own merits' (166), but fails to apply it structurally. Hence, he offers a 'formula for a word in any inflected language' (159), whereas the structure of words in various languages is quite different; it is meaningless to combine the structural analyses of words in languages of different structure, as may be seen from H. J. Uldall's letter which Gray courteously prints on pp. 146-7. The verb is defined as 'a word characterised by inflexion, if inflected at all, for person' (178); but this does not define the verb e.g. in Southern Paiute or Zuni, nor will it serve for Hidatsa, where any stem may take on any personal element, and may then take on any of a class of final (syntactic) elements, some of which would make the form verbal (for us) while others would not. Further on we read that 'the accusative has a terminative or illative signification . . . as in Latin' (193); but in Arabic most of these significations would appear in the genitive.

How much distortion may result, is seen from the statement 'prepositions serve as substitutes for inflexion in analytic languages' (157). Descriptively, we would not make such a statement, for as far as these languages are concerned, the prepositions have their own place in the economy, and substitute for nothing. But, what is more important, this statement conceals a possible great difference in the economy of languages between the inflexions and the prepositions (which often, indeed, have replaced inflexions historically). For if the inflexions are grouped into a closed contrastive set (category: e.g. cases, aspects), then every form of the class concerned (here nouns, verbs), as it occurs in speech, necessarily belongs to one of the inflexions as against the others; and forms without inflexional element (if there are such: e.g. vocative in some languages, jussive in Semitic) contrast formally with the other inflexions of that category as having a zero inflexional element. On the other hand, in languages where the analogous utterance has merely a preposition or the like, the contrast within a closed group of possibilities does not exist; the preposition contrasts now with all the other words of the same form-class which could stand in that position, and the utterance has no formal description in that language beyond the syntactic pattern which is realized in that particular combination of words.

Since one cannot do entirely without structural interpretations, the

linguist who does not explicitly work out the structure of other languages is in danger of interpreting them in terms of his own. Most of the slips listed above have been in the direction of regarding English or IE categories as general distinctions which must exist, if with different details, in all languages. The grammatical statements are mostly based on IE; e.g. in the discussion of persons (203) there is no mention of the Algonquian obviative (fourth person). Gray is justified, in that he announces that he will stress IE (vii), but readers will assume that these descriptions cover all or most languages. This home influence becomes more apparent in the examples which follow. In listing non-IE distinctions, the author writes: 'Many languages carefully distinguish in the pronoun between inclusive and exclusive forms' (182). But, of course, they distinguish this no more carefully than anything else; it is merely that English speakers are not accustomed to making such a distinction. A Hidatsa speaker might say that English carefully distinguishes between singular and plural. Again: 'So meagre is the language (Aranta) that it is frequently impossible to determine the meaning of its words without knowledge of the circumstances under which they are spoken' (155). But the meaning of linguistic forms in any language is known primarily from the circumstances in which they are spoken, and one can use the short-cut of translating them into a second language only to the extent that the second language has roughly similar distinctions between the meanings of its own linguistic forms. The same slip appears when the author says, concerning the usefulness in Asia and elsewhere of an international language based upon Latin: 'Knowledge of the phonology and morphology would be fairly easy to gain; but the vocabulary would remain hopelessly alien' (36). He can say this only because Latin phonology and morphology are sufficiently similar to those of the languages he knows. To a Chinese or Navaho, they would be as alien as the vocabulary, and far harder to acquire. (His suggestion of reviving Latin for this purpose likewise misses the point that the desideratum in an international language is a simple structure.)

The structural method is basically the placing together of any formal features of a language which in respect to any criterion are similar. Sounds in each language may be grouped according to certain phonetic features and certain complimentary distributions in respect to the other sounds in the flow of speech; we find this classification into phonemes particularly convenient because in terms of it we can briefly identify the sounds of any utterance in that language. The phonemes

may be grouped according to the positions they can occupy in respect to other phonemes, and insofar as this yields distinct classes, such as consonants and vowels, we may describe in terms of them the shapes of linguistic forms in that language, and the relations between certain partially similar forms. In the same way, we arrange various features of the occurrence of morphemes: the positions each one occupies in respect to other morphemes, the types of combinations into which it can enter, the particular morphemes with which it actually combines. Such arrangements give us various classifications which supplement each other. If we find two or more morphemes which enter into complementary (contrastive) combinations, but whose meanings are the same, and the sum of whose positions in these combinations is the same as those of single morphemes, we group them as suppletive variants (e.g. *is*, *am*, *are*). Where we find many morphemes whose positions and range of combinations is the same, we group them into a major form-class; and where we find that some of these will combine only with particular members of the other classes, we group them into sub-classes.

We call this 'structure', because all these statements and classifications for any given language can be organized in terms of particular units (phonemes, morphemes, etc.) and relations existing among them. We call it 'pattern', because many of the relations crisscross each other, often in parallel lines. Some linguistic facts will escape the investigator who does not try to arrange the initial classifications into possible networks, who does not look for relations between the relations. If the relations between certain sub-classes may be arranged into a category, their place in the structure will be quite different from that of relations which cannot be so arranged. Thus the difference between a category of tenses, and a number of semantically similar morphemes (words or affixes) referring to time, is that the absence in an utterance of any such morpheme means that it is indifferent as to time, whereas the absence (if that is possible) of any tense-morpheme from an utterance in which the tense-category is used indicates a particular kind of time-reference (expressed by zero-affix) contrasted to the time-reference of all the other tense-morphemes. That this patterning of linguistic facts is not a forced laboratory arrangement, follows from the fact that it determines an important type of linguistic event: analogic change. Analogic new formations, whether or not they become accepted (or yield forms already existing in the language), can be simply described on the basis of the existing pattern. Therefore, whereas phonetic change may yield new classifications in the language,

analogic change never can, but only adds a new member to an existing class, frequently transferring a form from a rare (small) class to a common (large) one in the same category.

It is important to recognize that language is a system of units and their relations, because that often serves as our criterion of what material is language and what is not. Only on this basis do we exclude at present the vast and as yet unorganized fields of expressive modifications (e.g. anger-modulations, intonations of sarcasm, etc.), and of the linguistic differentiae used by particular sections of the community (e.g. characteristic intonations of girls, etc.). All these have conventional phonetic forms and meanings, no less than language proper, and are marked off from language only because we cannot analyze them structurally in the same way. It is therefore unfortunate that Gray uses 'language' (for French language) to include the babblings of infants (15), which do not involve any linguistic system, or that he should put in one category American Indian 'winter counts', which were not based on the system of language, and our own writing, which shows a one-to-one correspondence with our language structure (18-9). The same considerations suffice to disallow his separation of morphology from syntax, as belonging to two different orders of linguistics, the 'mechanical' and the 'psychological' (145); for the type of predications is the same in both: relations of order, combination, and the like among linguistic forms, the difference between the two lying usually in the individuals (linguistic forms) of which they treat.

Some of the difficulties encountered in this book suffice to show why the structure of a language can be described only in terms of the formal, not the semantic, differences of its units and their relations. Though Gray says that classification must be by form (which, however, he defines as 'morphology viewed in the light of historical development', 165), the criteria which are actually used in the book are semantic almost throughout. Thus, 'the ultimate identity of the noun and the adjective are clearly shown in such abstracts as *the beautiful*, which are practically synonymous with *beauty*' (169); but the semantic identity does not alter the structural fact that their phonetic forms and their relations to other words (e.g. to *the*) are different. Again: 'A verb is the sole part of speech which can form a complete sentence' (230); but whether in any given language a verb can or can not do this is a question of the formal structure of that language, and can not be stated absolutely on the basis of the semantic value of verbs. Again: 'The ultimate distinction between a compound and a non-compound is purely semantic: has, or has not, the word-combination acquired a

special and distinct connotation' (160). In each language, however, we would find regular formal differences, as in *res^lpublica* : '*res^lpublica* and all the other examples Gray gives; were it not so, how could we distinguish between compounds and 'idioms' (since Gray uses that term, 9), which also have special connotation, but are formally phrases of separate words? The statement 'The singular denotes either a single thing, or a group of things regarded collectively; the plural more than one thing regarded as individuals' (179) is wrong even for English (e.g. *the masses* is a 'collective' in Gray's sense above, but is plural in form); it is irrelevant for languages of different structure, e.g. those which have no plural but only a distributive; and it is useless in any case, being circular. For how do we know if a number of things is regarded collectively or individually?—for the most part, by whether the word is in the singular or in the plural.

The treatment of aspects here is a good example of the irrelevance of semantic classification. The IE ingressive, terminative, etc., are given together with the Semitic reciprocal (207), without any indication that these meanings are expressed in IE by determinatives (*n*, *sk*, etc.) which are added to a few particular bases, but in Semitic by a prefix + vowel-pattern which may be used with almost any root and which is a member of a closed category of contrastive aspects without which no Semitic verb exists. And on p. 204 we find: 'The meaning of many verbs in itself denotes their aspects; e.g., English *strike* is instantaneous while *beat* is durative', a distinction which has no formal basis and which is entirely inconsequential to linguistic structure, for if we desire we can make an endless number of similar non-formal distinctions in any material. True, after the formal mechanism of a language has been worked out, it may be interesting to ask how it compares with other languages in meeting the same situations, i.e. in the rough classification of meanings, but that cannot be done before the structure is described.

Explanations of the causes of linguistic events are unwise at the present stage of our knowledge. The logical analysis of ideas, which is used by several European linguists today, is irrelevant to linguistic structure. When Gray says 'From the point of view of strict logic, there should be no neuter nominative. An inactive thing cannot, theoretically, have the active function implied by possession of an active (i.e., nominative) case' (192-3), he merely shows that these logical categories have nothing to do with it, because, in various languages, nouns in the neuter class do have the affix and sentence position called nominative. Nor is anything gained through teleological

explanations, such as that a particular lengthening occurs 'to compensate for the loss of a phoneme' (66); the same facts are stated if we say that the loss is a condition for the lengthening.

Particularly undesirable are psychological explanations. They add nothing, as when we read concerning the use of the second person familiar pronoun: 'words tabued as too exalted or too debased for ordinary use may be employed as terms of familiarity. . . . In all these cases the true second person is employed only in addressing the Deity or, at the other extreme, children, servants', etc. (265). It is pointless to explain a single linguistic relation by two different psychological relations, as is necessary here. Even if we could find a single psychological relation in terms of which these two situations would be similar, it would give us, indeed, a single range of meaning for 'tutoyer', but would not 'explain' it. These explanations are ad hoc: 'The cow has practically only one designation throughout IE, since her one special function is to give milk. The horse, on the other hand, is used for many purposes' and therefore various names have developed in various languages (268). When it comes to etymologies, Gray recognizes the exoetetical character of such methods (279). They cannot be tested, and arise from no evidence beyond the linguistic fact itself: e.g. 'Progressive assimilation is mechanical. . . . In regressive assimilation and metathesis the process is psychological' (73), whereas all we can say about both is that they are the result of bad timing in a set of habitual motions.

Psychological explanations are often circular: 'The earliest stages of IE had no future, but as need arose to express future time and, consequently, to denote such a tense, a number of devices were adopted' (20); the tense is there because they had need of it, and the proof that they had need of it is that the tense is there. Even on their own level they may not be sufficient causes: words suffer pejection because of the 'natural desire to veil unpleasant facts by pleasant words' (266); but why does this occur only for certain such facts and words, and not for others? In some cases they break down, as when Gray writes: 'names for parts of the body . . . show curious transfers of meaning' (270); facts are 'curious' only if the explanation offered for their class fails to cover them, and it is the explanation that is at fault, not the fact that is curious. Investigators who use such explanations often miss possibilities of further formal analysis. On p. 239 the author writes: 'practically only the psychological element remains to explain the arrangement of the words of the sentence'; but if he had not been

satisfied with such a statement, he would, on closer analysis, have found the class and sub-class selections that make up most of syntax.

It is therefore pointless to offer psychological explanations for linguistic phenomena. Gray says, indeed: 'I commit myself neither to a vitalistic nor to a mechanistic theory of language' (viii); nevertheless, a mentalistic theory is used throughout the book. 'Behind the vocal and auditory apparatus lie mental and psychological processes. . . . In its non-physiological aspect it [language] is the result of unnumbered centuries of effort to express facts and ideas' (7). How we know of the mental processes or of the centuries of effort, is not indicated. Language is referred back to mentalistic causes: 'It is a physical and external manifestation of a non-physical (emotional, intellectual, spiritual) and internal state, an endeavour to represent materially what is essentially immaterial' (15); on p. 7 he recognizes that this is 'a paradox', but fails to see that such a paradoxical result destroys the theory. Mentalistic definitions like 'The sentence is the oral expression of a mental concept' (225) are, of course, of no use in identifying the sentence. In general: 'Thought is indispensable in language' (88); 'the more complicated the thought, the greater the need of exact expression in speech' (96). On the other hand, 'the influence of speech on thought is very great; . . . any novel idea remains more or less vague in the thinker's mind until it has been expressed' (95); 'Soliloquy is very frequently an endeavour to clarify the individual's thoughts by translating them into audible speech' (17). It is hard to see how the author pictures this, in view of his statement that 'underlying psychologies . . . often hamper them [languages]; while they in turn . . . hamper the psychologies' (7).

These few quotations suffice to show how difficult it is to offer coherent mentalistic statements about language. Such statements lead to unjustified attitudes, as when the author argues on this basis that 'no language is a perfect instrument which can render each and every concept of the speaker' (7); there is no support for this opinion, since we know nothing about any 'concepts' or observations which members of a group could express but which can not be expressed in the language that the group has developed up to that point. There is a necessary circularity in all these statements, since our only evidence for thought is language. 'Whether a given language shall live or die seems to depend not so much upon economic laws and the like as upon that imponderable sentiment or emotion which constitutes, on the one hand, will that it shall live or, on the other, indifference to its fate'

(33). If it dies, that is because there was no will that it should live, but the presence or absence of that will is discovered only by whether it lives or dies. These statements cannot be tested, and their adoption blocks the road for further investigation: in this case, seeking the laws which determine the death or survival of languages, laws that would probably be identical with laws of social and cultural change, since the use of language is itself a cultural event. Attitudes about the psychologies underlying languages are doubly undesirable, since they imply that different language communities have different psychologies (and presumably worse than ours, since we cannot say in their languages all that we can say in ours), a conclusion for which there is no evidence, and which has dangerous social implications.

Any psychological or sociological interpretation of language is permissible (and by the same token every one is irrelevant) so long as it does not conflict with the results of linguistic investigation; which of them is desirable can only be decided in terms of the other sciences. It is more efficient, therefore, to formulate the units and relations and events of language directly in linguistic terms. The statements of a science should be given in a form available to all those who are interested in it; they must refer to such features as the scientist, with his apparatus and method, can distinguish or measure.

Thus, however we may individually look upon 'meaning', the meaning of linguistic forms must be made identifiable by some linguistic definition. It avails nothing to say that it is a mental concept, or that it 'becomes clear only when the word's history is studied' (251). The meaning of a linguistic form may best be defined as the range of situations in which that form occurs, or more exactly, it is the features common to all the situations in which the form occurs and excluded from all those in which it does not. This furnishes a test which, though impossible in practice, is at least conceivable. In practice, we use approximations to this: the meaning of a form class is the contrast between its positions and combinations and those of the other form classes; the meaning of individual morphemes is approximated by contrasting the situations in which they occur in an utterance with the situations in which the same utterances occur without them, and so on. With such a definition, a statement like the following would be an obvious corollary: 'when a word is borrowed by another language, it may come to diverge widely in meaning from its earlier sense' (273). It is a corollary because borrowing is the use of a foreign word in a native utterance, in a situation in which that word would be

used in the foreign language. The only uses of the word which are directly equivalent in both languages are those occurring in the situations in which the borrowing takes place (in which the native speaker is constructing an analogy to the foreign utterance). All further occurrences of the word in native utterances are determined by native conditions; the range of situations (i.e. the full meaning) of the word in the foreign language is not borrowed.

With an apparatus of linguistic definitions, the work of linguistics is reducible, in the last analysis, to establishing correlations. Correlations between the occurrence of linguistic forms and the occurrence of situations (features of situations) suffice to identify meanings; the term 'to signify' can be defined as the name of this relation. There is therefore no need to regard 'sign' or 'symbol' as primitive terms of linguistics. To say that linguistics is a 'science sémiologique' is to push its foundations back to a 'science' which cannot be studied objectively, to a relation of 'signifying' (16-7) which requires something like teleology for its understanding. And correlations between the occurrence of one form and that of other forms yield the whole of linguistic structure. The fact that these correlations may be grouped into certain patterned regularities is of great interest for psychology; but to the pattern itself need not be attributed a metaphysical reality in linguistics. Gray speaks of three aspects of language (15-8), basing himself on the *langue-parole* dichotomy of de Saussure and many Continental linguists. This division, however, is misleading, in setting up two parallel levels of linguistics. 'Parole' is merely the physical events which we count as language, while 'langue' is the scientist's analysis and arrangements of them. The relation between the two is the same as between the world of physical events and the science of physics. The danger of using such undefined and intuitive criteria as pattern, symbol, and logical a prioris, is that linguistics is precisely the one empirical field which may enable us to derive definitions of these intuitive fundamental relationships out of correlations of observable phenomena.

Aside from these general considerations of linguistic method, there are a number of specific points in which this book is weak. The section on phonetics is perhaps particularly so. Thus we find, 'the sound causes vibrations in the air' (6), whereas 'sound' is merely our name for the effect of these vibrations impinging on the ear. The descriptions of sounds and changes fail to provide for positional variants and for the diversity of languages (50, 63). On p. 55 is an impressionistic

chart of vowels; diagrams of the phonologically determined relations among the vowels of a language may be of interest, but it is hard to see the value of absolute phonetic arrangements for 'any language'. It was especially injudicious to place long vowels at points indicating particular differences in quality as against the respective short vowels. Difference in quality between length grades differs widely in various languages; in Estonian the qualitative difference between long and short grades is slight, between long and extra long grades, considerable. Jones' cardinal vowels, which Gray uses, may be of practical service, but have no more theoretical importance than any other vowels. Like many others, Gray tends to use articulatory descriptions for the consonants, but acoustic ones for the vowels.

In the morphology, Gray offers a formula of the structure of a word (159). Formulaic representation, which undoubtedly furthers our grasp of a set of relations and our ability to manipulate them, is of value only insofar as its application is exact. The formula given here presents two difficulties. First, it should not have been in the form of an equation, for that implies that the operations indicated in the left-hand side will yield the right-hand side. But addition of the various elements given here will not yield a word, since the formula omits the specific word-features, etc., which are not characteristics of the several parts, but are features of the combination process. Second, the notation $\sum_0^m D$ does not mean anything here, and Gray gives it no new notational value of his own.

The historical method is very well presented and utilized in this book, as was to be expected in view of Gray's work in historical linguistics. We may question only the rare remarks about the causes of change, as in 'fine distinctions between forms become worn down, not only through phonetic decay, but also because of sheer slovenliness on the part of the speakers' (97-8), or when Gray succumbs to the popular temptation of asking the cause of the Germanic sound shift (350). The absence of any discussion of dialect geography is surprising.

Gray's interest in the history of forms is such that he frequently offers speculations about their origin. E.g. 'the pronoun is, in all probability, the source of the categories of number and gender, and of case' (175; in all languages?); 'the personal pronoun is the most primitive of all parts of speech; the one for the first person was the earliest' (177). Such guesses conjure up a false picture of language stages which had only pronouns, and the like. Early stages can be

pictured, if at all, not by arguing the respective merits of various parts of our present structures, but by tracing the development of our structures as a whole. There is also the danger of giving psychological explanations of the origins of our structure, on the assumption that the categories of language are determined by preconceived ideas (though that still would not explain the structural form). Thus: 'The chief source of grammatical gender seems to lie in animism. . . . The masculine was the animate, concrete', etc. If a word, e.g. 'tree', had different genders, it was because 'the tree was sometimes regarded as a mere lifeless, sexless, inanimate thing (neuter), sometimes as a female (feminine, passive) living producer, and sometimes as a male (masculine, active) living producer. . . . It is interesting to note that the conclusions here reached on strictly linguistic evidence had already been attained in principle by the author of the fourteenth century *Grammatica speculativa*' (184-7).

Gray correctly says: 'For the present, the whole question of the origin of language must be ruled out of the sphere of scientific consideration' (40). Nevertheless, he permits himself guesses about the early development of language, a subject almost as dangerous. 'For the most part, the meanings of words, at first general, and perhaps vague, tend to become more and more specific' (252); they are vague to us only because we do not know the exact range of situations in which they were used. There is a suggestion 'That the earlier forms are the more complex, and the later the more simple, while the reverse holds true for the functions' (21). This interest in origins is connected with his view of the value of linguistics: 'Perhaps the most valuable service rendered by the study of language, at least from the point of view of general culture, is the light which such study casts on the history of a people' (10). Recognition of the value of linguistics as a science in itself and as throwing light upon the structure of human action, would have resulted in greater attention to structure.

Here and there appear value judgments which might well have been omitted: 'the more developed languages' (179); 'It does not seem pedantic to regard such losses [of the *I shall* : *you will* distinction] as retrogressions' (98); 'true education, as contrasted with the mere acquisition of facts and "practicality" which now passes for it, is impossible without knowledge of the Greek language and love of its literature' (429); 'Only when a minority-language becomes a means for violent subversive political activities does governmental action appear to be justifiable' (119; but it is always the government that decides what is subversive).

Of the errors that have slipped into the book, the following may be mentioned. Pictographs are not alphabetic beginnings (18), for they do not normally evolve into alphabets. *Khurrian* (380) is usually written *Hurrian*, and the reading *Kharrian* is impossible. The division of Akkadian (360) is wrong, for Assyrian and Babylonian are local dialects. Hebrew was spoken up to six (not thirteen) centuries before the masoretic vocalization (359); Semitic reconstruction yields not the root-type KWM (358) but rather KU:M. The theory that the Romance languages were differentiated by different substrata (336) requires considerable limiting. The arrangement of the Germanic languages (345-9) is not very satisfactory: Gothic is ascribed, 'in reality, to North Teutonic'; and the general character of the division into Low and High German is lost. The statements about Siouan (180) do not apply to the whole Siouan family; they are not true for Hidatsa. In view of the linguistic work that has been done on them, Shawnee might have been added under Algonquian and Southern Paiute under Uto-Aztecan in the valuable list of languages.

Such slips, however, are nearly always present in books that cover so wide a field. In the treatment of IE they are comparatively rare. There are excellent statements on phonetic law (75 f.) and on the study of names (122 f.). The major difficulties arise from the lack of structural analysis and from the mentalistic formulations. In his preface, the author offers the book in part as an introduction to Indo-European linguistics; it can only be regretted that he did not more definitely restrict it to that end.

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[The following review of Gray's *FOUNDATIONS OF LANGUAGE* is added as a valuable supplement, especially in its bibliographical notes, to the more general discussion by Harris.]

This new book is noteworthy, not so much for originality of thought and theory (for in this respect it falls behind the works of Bloomfield and Sapir), as for the collection and arrangement of material. By embodying the bibliography in the text, the author is able to criticize and evaluate his references from the historical viewpoint. Unfortunately, the intrusion of special bibliographies sometimes (especially in Chap. 13) interrupts the argument. It would have been better to mention the authors' names in the text and to add the specific citations in footnotes. In general, Gray's bibliographies present a good and careful selection, thus for Indic (317), Iranian (321), Slavic (355-6),