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LANGUAGE सन्द AND LANGUAGES

AN INTRODUCTION TO LINGUISTICS

BY

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IN McGILL UNIVERSITY

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TO
F. B. G.

PREFACE

THIS book is intended primarily as a general introduction to the science of language. Emphasis is laid, therefore, on fundamentals and organization rather than on erudition and an abundance of facts, while the terminology current among linguists is not sacrificed to the amateur's desire for a more popular form of presentation. It is the author's belief that a technical nomenclature is indispensable to any science and that no substitute can escape the danger of inadequacy and perhaps ambiguity. The popularizing chemist does not translate his scientific terms into nonscientific language, but the interested public is invited to accept these terms with their meanings if it wishes to learn something about chemistry. In linguistics the necessity of a proper terminology is particularly great because of the risk of contamination involved in the use of many philosophical and psychological terms traditionally charged with meanings which are cognate to, but by no means identical with, the subtle distinctions suggested by linguistic analysis.

For the general reader our plan and method mean both an advantage and a handicap. But the advantage can come to him only on condition that some patient thinking about fundamental processes be gone through in terms which will, for a time perhaps, stare at him with varying degrees of strangeness. Once the most essential distinctions have revealed to him the secrets of a few score of unfamiliar names, however, he is on the way to a sounder understanding of what language is, of how it comes about, how it works and changes, of what its relations are to the individual and to mankind. Although it would be rational and, for the more ambitious

of our readers, advisable to take the chapters in the order given, it may be suggested that the less abstract second part will probably be understood without the first.

It is hoped that the professional linguist will find it stimulating to read some of the key chapters of Part I, where such basic topics as meaning, the word and the sentence, derivation and composition, categories, etc., are discussed. If he disagrees, as he undoubtedly will now and then, his very disagreement may contribute to clarify in his mind certain general conceptions, and his constructive criticism may help the author to improve upon his own views.

That the interest in the study of language is increasing on this continent may readily be gathered from the expansion and significance assumed by such an organization as the Linguistic Society of America and from the growing attention given to language by scholars of allied interests. Judging from this, and interpreting the opinions expressed in various quarters, the author likes to believe that this book will answer a real need. The sociologist, the psychologist, the anthropologist, and the philosopher will find in it a survey of the outstanding results and prevailing tendencies of the science of language, and should the need for a deeper study of some specific topic arise, the carefully chosen bibliography will prove a time-saving help. There seems at any rate to be room for a greater variety of works of this nature in English, as some of the existing ones are too old, while others are written from entirely different points of view.

My obligations in the preparation of these chapters have been so many that it would be impossible to trace them all to their proper sources. The references in the text and the bibliography are to account for everything that to my consciousness requires a special mention. For my approach to the semasiological topics I am particularly indebted to Ferdinand de Saussure's *Cours de linguistique générale* and to Ogden and Richards' *The Meaning of Meaning*. The data in regard to

the non-Indo-European languages are here and there due to first-hand knowledge; in a number of instances, namely where the available library facilities made it possible, special grammars and monographs were consulted; on the whole, however, the standard works of Steinthal, Friedrich Müller, F. N. Finck, and above all P. W. Schmidt's *Sprachfamilien und Sprachenkreise der Erde* and Meillet and Cohen's *Les langues du monde* were freely drawn upon. The paragraphs relating to these non-Indo-European languages are presented here because the author knows how keenly interested the general reader is in learning something about linguistic stocks other than his own and that through this acquaintance, however superficial, his conception of language is likely to be broadened and rectified. The information referred to is not intended to be anything like a profound analysis of conditions, but merely a collection of facts selected from the above-mentioned sources and believed to be of general interest.

I gratefully acknowledge the encouragement and aid received from several of my friends and colleagues. Dr. H. Walter, of the Department of Germanics of McGill University, has not only taken a sympathetic interest in my work as it was progressing, but has also shared with Professor G. W. Latham, of the English Department, the task of reading the entire manuscript. I am also indebted to Professors H. G. Files, of the English Department, and C. L. Huskins, of the Department of Biology, for reading parts of the manuscript. To all these I wish to express my thanks for their helpful suggestions. Miss B. Meyer, of the Department of Germanics, has rendered valuable assistance in the preparation of the manuscript, while Miss N. Jackson, third year Arts, McGill, has graciously placed at my disposal her talent in drawing the diagrams and map. My gratitude is due to Professor M. G. Bolling, editor of *Language*, the Journal of the Linguistic Society of America, for giving me permission

to reprint as a section of this book my article on "The Word and the Sentence" in the issue of September, 1929. And finally Mr. F. G. Wickware, of D. Appleton & Company, has so conscientiously read the whole manuscript and submitted such valuable suggestions that this book owes many improvements to his intelligent care.

W. L. G.

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ABBREVIATIONS

Alb.	Albanian
Arm.	Armenian
A.-S.	Anglo-Saxon
Bd.	*Band* ('volume')
Bulg.	Bulgarian
Celt.	Celtic
Da.	Danish
Du.	Dutch
E. or Engl.	English
F. or Fr.	French
G. or Germ.	German
Goth.	Gothic
Gr.	Greek
H.G.	High German
I.-E.	Indo-European
Iroq.	Iroquois
It.	Italian
Lat.	Latin
Lith.	Lithuanian
M.E.	Middle English
Mod. E.	Modern English
Mod. Fr.	Modern French
Mod. G.	Modern German
O.E.	Old English
O.F. or O.Fr.	Old French
O. Fri.	Old Frisian
O.G.	Old German
O.H.G.	Old High German
O. Icel.	Old Icelandic
O. Bulg.	Old Bulgarian
O. Slav.	Old Slavonic
O.N.	Old Norse
O.S.	Old Saxon
Plur.	plural
Sing.	singular
Skr.	Sanskrit
Slav.	Slavonic
Span.	Spanish
Sw.	Swedish
Vulg. Lat.	Vulgar Latin

PHONETIC AND OTHER SYMBOLS

In the following list the symbol = is not intended to express identity but approximation. Throughout the text phonetic symbols are enclosed in brackets. Phonetic transliteration is resorted to only where special reasons make it advisable.

[ɑ] = the first vowel of Engl. *father* and the vowel of Fr. *pas*.

[a] = the first vowel of Germ. *Vater*, the vowel of Fr. *la*, and the first element of the diphthong [aɪ] in Engl. *high*.

[æ] = the vowel of Engl. *fat* and of Du. *vet*.

[e] = the first element of the diphthong [eɪ] in Engl. *fate*, the vowel of Germ. *seht* and of Fr. *été*.

[ɛ] = the first element of the diphthong [ɛə] in Engl. *fair*, the vowel of Germ. *Brett* and of Fr. *même*.

[ə] = the vowel of Engl. *fur* and the second vowel of Engl. *father* and of Germ. *Vater*.

[i] = the vowel of Engl. *flee*, of Germ. *sie*, and of Fr. *il*.

[ɪ] = the vowel of Engl. *thick* and of Du. *ik* and the semi-vowel of the diphthongs [aɪ] and [eɪ].

[o] = the first element of the diphthong [oʊ] in Engl. *so*, the vowel of Germ. *so* and of Fr. *eau*.

[ɔ] = the vowel of Engl. *pot*, of Germ. *Topf*, and of Fr. *sotte*.

[œ] = the first vowel of Germ. *Köpfe* and the vowel of Fr. *sœur*.

[ϕ] = the vowel of Germ. *bös* and of Fr. *peu*.

[u] = the vowel of Engl. *you*, of Germ. *du*, and of Fr. *sou*.

[ʊ] = the vowel of Engl. *foot*.

[ʌ] = the vowel of Engl. *but*.

[y] = the vowel of Germ. *süss* and of Fr. *du*.

[ᵊ] indicates a glide at the end of a spoken text.

· after a vowel means long.

¯ over a nonphonetic symbol means long.

˘ over a nonphonetic symbol means short.

above a vowel means nasalization: thus [ã] = the vowel of Fr. *dans*; [õ] = the vowel of Fr. *on*; [ɛ̃] = the vowel of Fr. *sain*. Above the gutturals *k* and *g* it means palatalization.

above a vowel means main stress.

above a vowel means secondary stress.

[b] = as in Engl. *ball*.

[β] = the bilabial voiced fricative, phonetically identical with [w] but with a neutral tongue position.

[ç] = the *ch* of Germ. *ich*, the initial voiceless fricative element sometimes heard at the beginning of Engl. *huge*.

[χ] = the *ch* of Germ. *ach*.

[d] = as in Engl. *doll*.

[f] = as in Engl. *fail*.

[g] = as in Engl. *go*.

[ɣ] = the *g* of Du. *liggen*, that is, the voiced velar fricative as distinguished from the corresponding stop of Engl. *go*.

[h] = the initial aspiration of Engl. *hat*.

ɦ = phonetically, a glottal fricative with lip rounding.

[j] = the initial sound of Engl. *yes* and of Germ. *ja*; also the semivowel of diphthongs.

[k] = as in Engl. *come*.

[l] = as in English.

[m] = as in English.

[n] = as in English.

[ŋ] = the *ng* of Engl. *sing*.

[p] = as in Engl. *pat*.

þ = phonetically, identical with [θ].

[r] = dental *r* as in English.

[R] = uvular *r*, like that of most German and French speakers.

[s] = as in Engl. *house* (noun).

[ʃ] = as in Engl. *shoe*.

š = phonetically, same as [ʃ].

[t] = as in Engl. *toss*.

[θ] = the *th* of Engl. *thank*.

[ð] = the *th* of Engl. *the*.

[v] = as in Engl. *veil.*

[w] = the initial sound of Engl. *was* and of South Germ. *war*; also the semi-vowel of diphthongs.

[z] = as in Engl. *house* (verb).

[ʒ] = the *s* of Engl. *pleasure* and the *j* of Fr. *Jean.*

ž = phonetically, same as [ʒ].

ʔ = the glottal stop or catch, as at the beginning of initial vowels in German.

ˆ above the gutturals *k* and *g* (k̂, ĝ) means palatalization.

ˇ under a consonant means voiced (stretched vocal cords).

ˌ under a consonant means breathed (open vocal cords).

> = becomes.

< = is derived from.

≠ means not equal to, unlike.

* preceding a word means that the form so marked is hypothetically inferred.

GLOSSARY

ABLATIVE. A declensional form symbolizing removal, direction away, or various other aspects in various languages.

ABLAUT. The variation of vowel in different forms of the same word, possibly due to former accentual conditions.

ABSTRACTION. The mental separation of common elements from various experiences or concepts.

ACOUSTIC BASIS. The basis from which the speakers of a language identify various acoustic shades either as unimportant variants or as significant and essential differences.

ACOUSTIC COLORING. The property of a speech sound which characterizes it as producing the acoustic effect of a certain specific vowel.

ACOUSTICIST. A linguist who believes that the origin of language is to be looked for in acoustic imitation rather than in articulatory gesture.

ACTION WORD. A word used with a view to causing some action to take place.

AFFIX. A sound or sound combination which does not occur as an independent word or radical in the system of a language but whose addition to a word or radical changes the latter's meaning.

AFFRICATE. A consonantal combination of explosive and homorganic fricative interpreted as one sound unit.

AGGLUTINATION. The loose adding of affixes to radicals with the result of effecting various semantic changes.

AKTIONSART. The particular aspect of a verbal meaning symbolized by a special form in certain languages: for instance, the aspect of repetition, intensity, etc.

ALVEOLAR. A speech sound produced by contact of the tongue with the alveoli or teeth ridge.

AMPLITUDE. The range of a vibration on one side or the other from the middle point of motion.

ANALOGY. In a wider sense, the likeness of two or more linguistic units in some respect resulting in a corresponding likeness in some other respect; in a narrower sense, the likeness in meaning

of two or more linguistic units resulting in a corresponding likeness of sound.

ANALYTIC LANGUAGE. A language exhibiting the tendency to build up speech with simple words morphologically unanalyzable.

APHÆRESIS, APHESIS. The loss of the initial sound of a word.

APOCOPE. The loss of a sound at the end of a word.

ASPIRATE. (1) A speech sound of the [h] type; (2) a speech sound beginning with or ending in breath.

ASSIBILATION. The change of a nonsibilant consonant into a sibilant as a result of assimilation.

ASSIMILATION. The partial or total conformation of one sound to another one.

ASSONANCE. A species of rhyme in which the accented vowel of one word corresponds with the accented vowel of another word while the consonants of the two words do not correspond: for instance, *late* and *rake*.

ASYLLABIC. Not constituting a syllable.

ATTRIBUTE. A word denoting an attribute or quality and used in immediate conjunction with a noun: thus, the adjective of "this *beautiful* house" is used attributively.

ATTRIBUTIVE LANGUAGE. See *Noun language*.

AUTONOMOUS CHANGE. A sound change which is apparently not due to the influence of phonetic surroundings.

AUXILIARY. A word which is used to assist in the conjugation of a verb by symbolizing a particular aspect of a verbal meaning, such as time, modality, etc.

BACK VOWEL. A vowel produced by the arching of the back part of the tongue toward the palate.

BARBARISM. An offence against idiomatic purity of language when due to the influence of a foreign tongue.

BASIS OF ARTICULATION. The neutral position of the various parts of the speech organ characteristic of a community speaking a certain language.

BASIS OF AUDITION. See *Acoustic basis*.

BILABIAL. A speech sound for whose articulation the two lips are brought near or in contact with each other.

BREAKING. A sound change consisting in the transformation of a simple vowel into a diphthong through the influence of a contiguous sound.

BREATH. Voiceless speech resulting from the glottis being open.

BREATHED. See *Voiceless*.

CACUMINAL. A sound articulated with the tip of the tongue turned up and back toward the palate.

CATEGORIAL. Pertaining to some category.

CATEGORY (LINGUISTIC). An ideal semanto-phonetic pattern in a given language, instinctively experienced by the average speaker, deduced by him from the current language, and utilizable as a device of analogical multiplication and reproduction of linguistic forms.

CENTRALIZING STRESS. The stress distributed over parts of speech in such a way that a succession of stress groups results in which one highly stressed syllable is surrounded by several less stressed syllables.

CEREBRAL. See *Cacuminal.*

CHROMATIC ACCENT. Pitch accent or musical accent, produced by the flow of pitch in speech.

CLICK. A speech sound produced either by breathing in or by a suction at some point of the speech organ.

CLIPPING. The process of cutting a word so as to use only part of it instead of the whole: for instance, *auto* instead of *automobile.*

CLOSE or CLOSED. Said of a speech sound for whose production the largest possible mouth opening is small compared with that of another sound.

CLOSE CONTACT. The close degree of contiguity existing between a vowel and a following consonant in a sound combination in which the consonant suddenly cuts off the vowel at a moment when the pronunciation of the latter is still very energetic.

COMPOUND. A word consisting of two parts each of which also exists as a complete word or as a radical in the system of the language concerned.

CONDITIONED CHANGE. See *Heteronomous change.*

CONGRUENCE. Agreement in some formal feature of words used in a speech text.

CONJUGATION. Modification of the verbal forms for the purpose of temporal or modal symbolization.

CONSONANT. Either a pure noise, that is, a speech sound obtained by mere friction or explosion, without any voice at all, or a noise accompanied by voice but in which the friction or the explosion is distinctly predominant.

CON-SONANT. See *Unsyllabic sound.*

CONSTITUTIVE CHANGE. A sound change carried consistently through the whole vocabulary of a language.

CONTEXT. A set of things or events related in a certain way. Such a context is external if the related entities are stimuli; it is psychological if these entities are engrams.

CONTINUANT. See *Fricative.*

CREOLIZED LANGUAGE. A language of a civilized people, especially European, mixed with that of one or more savage tribes.

CUNEIFORM. Referring to the wedge-shaped or arrowheaded characters of ancient inscriptions of various countries, such as Persia, Assyria, etc.

DECLENSION. Modification of noun, adjective, or pronoun for the purpose of syntactical symbolization.

DELABIALIZATION. See *Unrounding.*

DENTAL. A sound articulated with the tongue approaching or touching the upper teeth.

DEPENDENT CHANGE. See *Heteronomous change.*

DERIVATION. The process of forming new words by means of some incremental addition to or change of a word or radical.

DERIVATIVE. A word obtained by derivation.

DIALECTOLOGY. The study of dialects.

DIGRAPH. A combination of two letters representing only one sound.

DIPHTHONG. (1) A sound combination consisting of two vowels within the same syllable; (2) a sound combination beginning with a certain vowel and gliding off and on through gradual transitions to end in another vowel.

DIPHTHONGIZE. To change a monophthong into a diphthong.

DISSIMILATION. The process by which two similar neighboring sounds are made dissimilar to one another.

DOUBLET. One of two or more words in the same language derived from the same original but through different channels.

DUAL. A special form of noun, adjective, pronoun, or verb symbolizing a reference to two.

DVANDVA COMPOUND. A compound in which the relationship between the two components can be rendered by the conjunction *and.*

DYNAMIC ACCENT. See *Stress.*

ELLIPSIS. Omission from a construction of one or more words, which are obviously understood.

EMOTIVE SPEECH. Speech whose function is the expression of emotion.

ENCLISIS. The process by which a word loses its accent and becomes dependent on the preceding or following word with which it is felt to form one unit.

ENCLITIC. A word subjected to enclisis.

ENDING. A suffix whose function it is to symbolize some syntactical relationship.

ENGRAM. The residual trace of a sensory excitation.

ENGRAPHIC(AL). Pertaining to an engram.

EPENTHESIS. The addition of a sound within a word.

ETYMOLOGY. The branch of linguistics which investigates the origin of words.

EUPHEMISM. A word or expression with agreeable connotations substituted for a harsh, offensive or disagreeable word or expression.

EUPHONY. Pleasing acoustic effect produced by a sound or sound combination.

EXPLOSION. Slight puffing noise heard when the air is released after a temporary closure of the speech organ.

EXPLOSIVE. A sound which, when isolated, contains an implosion, a stop, and a slight explosion as the air is suddenly released at some point of the speech organ.

FLECTION. The process of modifying word radicals in a fusional way for the purpose of syntactical symbolization.

FOLK ETYMOLOGY. The popular transformation of a strange word so as to give it an apparent relationship to another word better known.

FORMATIVE ELEMENT. See *Nonradical.*

FORMULA. A fixed expression consisting of two or more words whose combination is interpreted as a unit with a specialized meaning.

FREE WORD STRESS. The stress given to a word in such a way that it has no systematic meaning, so that it may be slightly or considerably changed under rhythmical or other influences without the meaning of the word being affected.

FREQUENCY. The number of vibrations in a second.

FREQUENTATIVE. A verb or verbal form symbolizing a frequently repeated action or state.

FRICATIVE. A speech sound produced by the friction of the air being pressed through a narrow passage at some point of the speech organ.

FRONT VOWEL. A vowel produced by the arching of the front part of the tongue toward the palate.

FUNDAMENTAL (TONE). The lowest component of a complex tone.

FUSION. The process by which a semanto-phonetic element is combined with a radical in such a way that either or both of them are considerably modified in form while the radical meaning is also changed lexically or syntactically.

GEMINATION. The doubling of consonants.

GENDER. The form of a word used to symbolize a certain relationship to various classes of referents, such as male, female, big, small, weak, strong, etc., persons or things.

GENETICIST. A linguist who believes that the origin of language is to be looked for in articulatory gesture rather than in acoustic imitation.

GLIDE. A parasitical or transitional sound produced by the vocal organs moving from the articulation of one sound to that of another in speech.

GLOTTAL. A speech sound produced by a friction between the vocal cords or by a slight explosion at the sudden opening of the glottis.

GLOTTAL STOP (CATCH). A glottal produced by a closure of the glottis followed by a sudden opening, common in the pronunciation of German initial vowels.

GLOTTIS. The opening between the vocal cords.

GUTTURAL. A speech sound caused by a friction or explosion in larynx or pharynx.

HAPLOLOGY. The loss of one of two syllables as a result of dissimilation.

HARMONIC. A partial whose frequency is an exact multiple of the frequency of the fundamental.

HETEROMIXTURE. The mixture of two or more things, living beings, or processes of entirely different types.

HETERONOMOUS CHANGE. A sound change apparently caused or influenced by its phonetic surroundings.

HETEROSYLLABIC. Belonging to different syllables.

HIEROGLYPH. A character in the picture writing of the ancient Egyptians or, by extension, of other peoples, such as certain American Indians, etc.

HIGH VOWEL. (1) High pitched vowel; (2) closed vowel.

HOMONYM. A word identical or very similar to another word in sound but not in meaning.

HOMOPHONE. A word or part of a word identical in sound with another word or part of a word, irrespective of their meaning.

HOMORGANIC. Said of a speech sound produced approximately at the same place of articulation as another but in a different manner.

HYPERBOLE. A figure of speech in which the expression used is an evident exaggeration of what is meant.

HYPOTACTIC. Syntactically subordinated.

IDEOGRAM. An original pictorial element of writing, or a written symbol representing a whole referential complex rather than a word phonetically decomposable into sounds.

IDIOM. (1) The syntactical or structural form peculiar to a given language; (2) an expression conforming to the peculiar structural pattern of a given language; (3) the language or dialect peculiar to a people.

IMPLOSION. The noise accompanying the accumulation of air within the speech organ during its temporary closure preceding the release of the air.

IMPLOSIVE. A speech sound produced by implosion.

INCORPORATION. (1) The inserting of some derivational element within a radical, between radical and affix, or between affixes; (2) the fusion of verb and noun or pronoun object.

INFIX. An affix inserted within the body of a word or radical.

INFLECTION. See *Flection.*

INHARMONIC. A partial whose frequency is not an exact multiple of the frequency of the fundamental.

INSTRUMENTAL. A declensional case expressing means, agency, instrumentality, and various other aspects.

INTENSITY. The quality of a vibration which depends on its amplitude.

INTENSITY ACCENT. See *Stress.*

INTERVOCALIC. Placed between two vowels.

INTONATION. The musical ups and downs in speech.

INVERTED SOUND. See *Cacuminal.*

ISOGLOSS. The line obtained by joining all the points or places where the same linguistic phenomenon occurs.

ISOLATING LANGUAGE. A language which symbolizes all lexical references by means of unanalyzable symbols.

ISOPHONE. The line obtained by joining all the points or places where the same phonetic phenomenon occurs.

ITERATIVE. A verb or verbal form symbolizing a repeated action.

KOINÉ. A form of language resulting from a compromise between various dialects and used as a common means of communication over an area covering all the contributing dialects.

KYMOGRAPH. An apparatus with which curves of speech or other performances may be traced on smoked paper.

LABIALIZATION. See *Rounding.*

LABIO-DENTAL. A speech sound for whose articulation the upper or the lower teeth are brought in contact or proximity with the lower or upper lip.

LABIO-VELAR. A consonant articulated with rounded lips but with back tongue arching toward the velum.

LARYNGEAL. A speech sound produced by a friction or explosion in the larynx.

LARYNX. That part of the speech organ which extends from the upper ring of the windpipe to the hyoid or tongue bone.

LATERAL SOUND. A speech sound in whose production the air escapes on one or both sides of the tongue in contact with some part of the palate.

LAX SOUND. A speech sound in whose production the muscular tension of the articulating parts is not great.

LENIS. A voiceless consonant uttered with a lax articulation.

LETTER WORD. A word consisting of the juxtaposed initials of two or more other words.

LEVEL OF INTERPRETATION. The total complexus of individual thought and experience on which a person's interpretation of somebody else's speech is based.

LEVEL OF SYMBOLIZATION. The total complexus of individual thought and experience on which the speech of a person is based and with which it is colored as to its structure and significance.

LEXICOLOGY. That branch of linguistics which deals with finished words, their rise, diversification, loss, composition, etc.

LIQUID. A lateral, rolled, or trilled sound.

LITOTES. Figure of speech in which the expression used is a softening way of putting the content.

LOOSE CONTACT. The rather loose contiguity existing between a vowel and a following consonant in a sound combination in which the consonant follows the vowel only after the latter's pronunciation has undergone an appreciable decrease of energy.

LOOSE SOUND. See *Lax sound.*

LOW VOWEL. (1) Low pitched vowel; (2) open vowel.

MECHANICAL CHANGE. A sound change due to articulatory influences.

MEDIAL SOUND. A sound placed between two others in a word.

METAPHOR. A figure of speech in which a phonetic symbol is used to symbolize a reference to another referential complex than its common one, inasmuch as the two offer a resemblance in some point or other.

METATHESIS. The transposition of a sound within a word.

METONYMY. A trope in which the semantic transferring is not due to a referential resemblance but to some actual relationship, such as contiguity in space or time, causality, etc.

MID-VOWEL. A vowel produced by the tongue arching toward the middle of the palate.

MODE. A distinction of form in a verb symbolizing the manner in which the action or state it denotes is conceived, whether as fact, desire, intention, order, possibility, etc.

MONOPHTHONG. A vowel whose quality is kept essentially constant throughout its pronunciation.

MONOPHTHONGIZE. To change a diphthong into a monophthong.

MOOD. See *Mode.*

MORPHOLOGICAL WORD. In a wider sense, a word consisting of two or more semanto-phonetic elements consciously interpreted as such; in a narrower sense, a word consisting of two or more semanto-phonetic elements of which at least one does not correspond to an independent word or radical in the system of the language concerned.

MORPHOLOGY. The branch of language study which deals with the structure of finished words.

MUTATION OF A VOWEL. See *Umlaut.*

NASAL. A speech sound in whose production the nasal cavity acts as a resonator.

NOISE. A sound of too short duration or too complex in structure to be analyzed and understood by the ear.

NONRADICAL. That element of a derivational word which in a given language at a given time is interpreted as a mere semanto-phonetic increment to the radical.

NOUN LANGUAGE. A language in which the pivot of the sentence is a noun or nominal radical.

NUMBER. The form of a word used to symbolize certain relationships to number or a certain congruence with other words in the speech unit.

NURSERY WORD. A sound combination used by a baby as an expression of a momentary need or emotion or as a means of obtaining some object or getting something done.

OCCLUSIVE. A speech sound produced by a temporary occlusion of the vocal organ at some point; see *Explosive.*

ONOMATOPŒIA. A word or expression imitating a sound or movement in nature.

OPEN SOUND. A speech sound for whose production the largest possible mouth opening is great compared with that of another sound.

OPTATIVE. A verbal form symbolizing a wish or various other more or less cognate modalities of the verbal meaning.

ORGANIC CHANGE. See *Constitutive change.*

OVERTONE. A component other than the fundamental within a complex tone.

OXYTONE. A word whose main accent lies on the last syllable.

PALATAL. A speech sound in which the tongue arches toward the hard palate.

PALATALIZATION. The change of a nonpalatal sound into a palatal one.

PALATALOGRAM. A diagram of the palate showing the part or parts touched by the tongue in the formation of any sound.

PARAGOGE. The addition of a sound at the end of a word.

PARATACTIC. Syntactically coördinated.

PAROXYTONE. A word whose main accent lies on the last syllable but one.

PARTIAL. One of the components of a complex tone.

PATOIS. A dialectal variety confined to a small area, such as a town or village.

PEJORATION. Depreciation in meaning.

PEJORATIVE. A word or expression whose meaning is depreciated by some morphological or semantic process; also said of the morphological process which causes such a depreciation.

PERIOD. The time between a phase of a vibration and its recurrence.

PERSON. The form of a word used to symbolize certain relationships to various classes of persons, such as the speaking person, the person spoken to, etc.

PERSONIFICATION. A metaphor in which human qualities are attributed to animals or things.

PHARYNX. The cavity between the œsophagus and the mouth cavity.

PHONATION. The process of sound production in speech.

PHONEME. A speech sound represented by a number of unimportant varieties but interpreted as a unit in a given language at a given time.

PHONETICS. (1) The science of sounds; (2) the branch of grammar or linguistics dealing with the sounds of a given language.

PHONOLOGY. The science of speech sounds, including the history and theory of sound changes within a given language or group of languages.

PITCH. The acuteness or gravity of tone depending on the frequency of the vibration producing it.

PLEONASM. The use of words whose omission would leave one's meaning intact.

PLOSIVE. See *Explosive.*

POLYGENETIC. Having many distinct sources.

POLYSEMY. Multiplicity of meaning.

POLYSYNTHESIS. The combining of many derivational elements into one long word which can be rendered in English only by a paraphrase or a whole sentence.

POSSESSIVE LANGUAGE. See *Noun language.*

POST-DENTAL. See *Alveolar.*

PRE-DENTAL. A speech sound produced by the front tongue approaching or touching the upper teeth.

PREDICATE. (1) The adjective or noun predicated of a subject by means of the verb *to be* or some similar verb: for instance, "this house is *beautiful*;" (2) that part of a sentence which contains what is said of the subject.

PREDICATIVE LANGUAGE. See *Verb language.*

PREFIX. An affix added at the beginning of a word or radical.

PROCLISIS. The process by which a word loses its accent and becomes dependent on the following word with which it is felt to form one unit.

PROCLITIC. A word subjected to proclisis.

PRODUCTIVE AFFIX. An affix which at a certain time in a certain language can be used freely for the derivation of new words or forms on a large scale.

PROMOTIVE SPEECH. Speech whose function it is to promote certain effects or to carry out one's intentions as to certain things or events.

PROPAROXYTONE. A word whose main accent lies on the last syllable but two.

PROSODY. The part of grammar treating of the laws of versification or metrical composition.

PROSTHESIS. The addition of a sound at the beginning of a word.

PSITTACISM. Verbalism, the use of words whose meaning is not or imperfectly understood by the speaker.

QUALITATIVE ACCENT. The dynamic and the chromatic accent, combined or separately.
QUANTITATIVE ACCENT. See *Quantity.*
QUANTITY. The duration of speech sounds or sound combinations.

RADICAL. That part of a derivational word which in a given language at a given time is interpreted as the basic one, both phonetically and semantically.
REDUPLICATION. The process by which one or more syllables of a word are repeated in the formation or structure of that word; also the syllable or syllables thus added.
REFERENCE. The mental direction toward a thing or event or its engram, as symbolized by a phonetic symbol in narrative speech.
REFERENT. The thing(s) or event(s) referred to by a phonetically symbolized reference in narrative speech.
RESONANCE. The increase or prolongation of sound due to the sympathetic vibration of some body capable of vibrating in the proper period.
RESONATOR. (1) An open cylinder or a hollow brass ball with one or two apertures used to intensify and modify a musical tone by its resonance; (2) any receptacle or cavity acting in the above-mentioned function.
ROLLED CONSONANT. See *Trilled consonant.*
ROOT. The ultimate constant unit common to all cognate words and forms in all languages related to one another.
ROUNDING. The process of lip rounding in the formation of speech sounds.
RUNE. A character of the alphabet used by the Germanic tribes from about the 3d century A.D.; they were used as magic signs and in writing.
RUNIFORM. Having the form of runes.

SANDHI. The various phenomena of assimilation or mutual influence resulting from different sounds being used in conjunction.
SEMANTICS. The branch of grammar dealing with meanings.
SEMASIOLOGY. See *Semantics.*
SEMEIOLOGY. The science of signs and symbols.
SIBILANT. A hissing sound.
SIDE CONSONANT. See *Lateral sound.*
SIGN. "A stimulus similar to some part of an original stimulus and sufficient to call up an engram formed by that stimulus" (Ogden and Richards, *The Meaning of Meaning*).

SIGN SITUATION. A situation which can be formulated in terms of one of its elements being the sign of the other.

SIMPLE WORD. A word which cannot be decomposed into two or more semanto-phonetic parts.

SOLECISM. A deviation from the idiom of a language or from its rules of syntax.

SONANT. (1) A voiced sound; (2) the sound carrying the syllabic top.

SPEECH. Language actually spoken, as contrasted with written language or with the system of a language.

SPEECH SOUND. A sound abstracted from some spoken language and contrasted with sounds outside of language.

SPIRANT. See *Fricative*.

SPONTANEOUS CHANGE. See *Autonomous change*.

SPORADIC CHANGE. A sound change occurring only in one or a few stray words of the vocabulary of a language.

STAMMBAUM. Pedigree.

STOP. See *Occlusive*.

STRESS. The complex of articulatory and acoustic features which cause a sound or sound combination to be felt as especially emphasized. The most important of these features are the intensity of the vibrations and the muscular energy of the articulating organs.

STRONG NOUN OR ADJECTIVE. A noun or adjective in Germanic languages whose stem used to end in a vowel.

STRONG VERB. A verb in Germanic languages whose preterit is formed by means of a change in the stem vowel and without the addition of a dental ending to the stem.

SUBGLOTTAL. Taking place or being located under the glottis.

SUFFIX. An affix at the end of a word or radical.

SUPRAGLOTTAL. Taking place or being located above the glottis.

SURD. See *Voiceless*.

SVARABHAKTI. A sound which has developed as a glide between two other sounds.

SYLLABIC SOUND. A sound bearing the highest top of a syllable.

SYMBOL. A sign symbolizing a mental reference to some thing or event.

SYMBOL SITUATION. A situation which can be formulated in terms of one of its elements being the symbol symbolizing a reference to the other.

SYMPATHETIC VIBRATIONS. Vibrations communicated to a body from some other sounding body by means of the air or an intervening solid.

SYNCOPATION. The dropping of a sound within a word; syncope.

SYNECDOCHE. A metonymy in which a whole is substituted for its part or vice versa.

SYNONYM. One of two or more words of the same language having the same or nearly the same essential meaning.

SYNTAX. The branch of grammar dealing with the relationship of various parts of speech and their symbolization.

SYNTHETIC LANGUAGE. A language in which the tendency exists to build up speech with morphologically complex words, especially of a fusional structure.

SYSTEM OF A LANGUAGE. The psychic organization and grouping of the semanto-phonetic patterns abstracted from a spoken language.

SYSTEM WORD. A finished word as it exists in the minds of the speakers outside of actual speech.

TAUTOLOGY. Needless or useless repetition of the same meaning in different words.

TEETH RIDGE. The alveoli, the ridge of upper tooth cavities situated between the row of the upper front teeth and the hard palate.

TENSE. The form of a word in a given language used to symbolize certain relationships to time, or a certain congruence with other words in the speech unit.

TENSE SOUND. A speech sound in whose production the muscular tension of the articulating parts is great.

TENUIS. A voiceless stop.

TIMBRE. The property which differentiates two sounds of the same pitch produced by two different instruments or by two different speaking persons.

TONE. A musical sound whose structure is not too complex to be analyzable by the ear and to make it distinguishable from another musical sound.

TRIAL. A special form of noun, pronoun, or verb symbolizing a reference to three.

TRILLED CONSONANT. A consonant made with a rapid succession of partial or entire intermissions by the vibration of some one part of the speech organ against another part.

TROPE. The use of a phonetic symbol for the purpose of symbolizing a reference to another referential complex than its common one.

TWANG. A sharp nasal tone pervading a person's speech.

UMLAUT. The modification of a vowel as a result of the influence of a neighboring one, especially *i*, *a*, or *u*.

UNIVERSAL. An abstraction interpreted either as a mere name (nominalism), or as a predicate which may be affirmed of a concrete reality (conceptualism), or as an actual reality (realists' viewpoint).

UNIVERSE OF DISCOURSE. That complexus of facts and thought which according to the circumstances is tacitly implied and understood in a given statement or discussion: thus, a person born and living in Canada and otherwise known to be of Anglo-Saxon parentage may be called a *native* of Canada, in which case the universe of discourse defines the meaning of *native*.

UNROUNDED SOUND. A sound produced with neutral or spread lips.

UNROUNDING. The changing of a sound with rounded lips into one with spread or neutral lips.

UNSYLLABIC. Not bearing the highest top of a syllable.

UVULAR. A speech sound for whose articulation the uvula approaches or touches the back tongue once or repeatedly.

VELAR. A speech sound produced by the tongue arching in the direction of the velum or soft palate.

VELUM. The soft palate.

VERB LANGUAGE. A language in which the verb constitutes the pivotal part of the sentence.

VOCALIC HARMONY. The agreement of the vowel of an affix with that of the radical.

VOCALIZATION. (1) The change of a consonant into a vowel; (2) (in Hebrew script) the diacritic signs used by the Masoretes to supply the vowels to the Hebrew Bible texts.

VOICE. The acoustic effect produced by the vibrations of the vocal cords and surrounding air.

VOICED. Uttered with voice.

VOICELESS. Uttered with open glottis so that the vocal cords do not vibrate.

VOWEL. A speech sound consisting of voice modified by sympathetic vibrations in the superlaryngeal cavities and in the production of which the air is allowed to flow though freely, with no or hardly any friction.

VOWEL HARMONY. See *Vocalic harmony*.

VOWEL MUTATION. See *Umlaut*.

VOWEL QUALITY. The acoustic coloring through which one vowel is distinguished from another.

WEAK NOUN OR ADJECTIVE. A noun or adjective in Germanic languages whose stem used to end in -n-.

WEAK VERB. A verb in Germanic languages whose preterit is formed by means of a dental ending.

WHISPER. In phonetics, voiceless speech resulting from breath escaping either through a partly open glottis or through the opening between the arytenoid cartilages.

WHISPERED VOWEL. A vowel produced without glottal vibrations, the vowel coloring being caused by the vibrations of the air in the resonating cavities of the speech organ.

PART I

CONSTITUENTS AND MECHANISM

LANGUAGE AND LANGUAGES

CHAPTER I

THE PHONETIC ELEMENT IN LANGUAGE

Speech Production and Sound Differentiation

Limits to the Analysis of Language

When we set ourselves to decompose language into its constituent elements, we must always be aware of the fact that this can be done only by some kind of vivisection. Language is at the same time complex and indivisible. In speech several departments of human activity have to coöperate, each supplying a number of auxiliary actions and each of these needing the assistance of organic or surrounding physical matter. Yet language is more than a mere aggregation of all sorts of coöperating factors. Every qualitative analysis, if actually carried through, would *ipso facto* destroy language itself. Thoughts make no language, nor do the articulations of the organs of speech, nor the vibrations of the air, nor sounds or combinations of sounds, nor even words or combinations of words. If one were trained to pronounce and to read correctly a whole book in a language understood neither by the reader nor by the audience, there would be no language; any arbitrary succession of sounds instead of those pronounced by the reader would produce the same effect. Language begins only when articulated sounds are combined and coördinated by one person's mind as the external signs for a communication or expression understood or understandable as such by another

person. If in the following, nevertheless, we proceed to a disruption of language by isolating and examining separately its constituents, we do so merely because of our inability to grasp at once the numerous aspects that it presents. Our analysis will be purely logical and methodological.

In language, then, we distinguish two groups of phenomena of a distinctly different order: first, a succession of articulations and sounds which constitute its physical aspect, and second, phenomena of a psychic character, namely, certain meanings connected with these external signs in both the speaker's and the hearer's mind. The interpenetration of these two aspects is so intimate that it is by no means possible to keep them always apart. Consequently it will not be felt as an embarrassing disturbance if, while chiefly focusing our attention on either of them separately, we often place one in the light of the other: it will only serve to remind us of their essential inseparability.

The Primary Unit of Language

The primary unit of language is that which represents a full communication or emotional expression and is generally known by the name of *sentence*. This does not mean that before we begin to speak, all the details of our communication should be clearly defined in our minds: the forms of language themselves influence the shape of our thoughts, and the structure of a sentence may be gradually built up while uttered. It matters not how long our mind is at work before a communication is finally completed and adequately expressed; as long as it has not reached the point of completion and expression, there may be language in the making but there is no integral linguistic unit.

Development of Phonetic Analysis

From the history of writing it appears that man's power to analyze a communication was at first restricted to its

psychological contents: the first writing systems consisted of symbols representing ideas no matter how they were pronounced. Only when the insufficiency of this procedure was recognized was attention drawn to the phonetic side of language. It was noticed that different communications contained a number of common parts, which could, therefore, be represented by symbols independently of their meanings. If we compare the following two communications, "I forget easily the names of historical persons" and "A naval man is not permanently on the sea or on a ship," we find that the phonetic combinations *na*, *per*, *ly*, *the*, and *or* are common to both. They consequently could be designated by the same phonetic symbols in whatever connection they were to occur. The first phonetic writing system was not based upon individual sounds but upon syllables or monosyllabic words.[1] A further analysis of the material of language was not reached until much later, when regular alphabets were devised with as many symbols as there were sounds distinguishable in the languages concerned. Again many centuries were to elapse between the discovery of alphabets and a clear understanding of sounds and their relationship to language. Alphabetic analysis was born out of the need for a more flexible system of writing. However great the advantages of alphabets have been for the general advancement of civilization, as far as phonetic and linguistic understanding is concerned they eventually proved to be one of the greatest handicaps. Instead of thinking in terms of sounds, people became accustomed to thinking in terms of letters. Sounds and language were not isolated as essentially spoken products or activities, but they were always associated with their written symbols. Under such conditions all efforts to obtain a better insight into the nature and distinctive qualities of language were bound to prove abortive.

[1] See page 53. *Cf.* also Isaac Taylor, *The Alphabet*, I, pp. 4–7.

We wish to emphasize, therefore, that the object of our present study is sounds and sounds only.

Speech Sounds Defined

Sound may be defined as the sensation resulting from the "action of an external stimulus on the sensitive nerve apparatus of the ear." "Atmospheric vibration is the normal and usual means of excitement for the ear; this vibration originates in a source called the sounding body, which is itself always in vibration."[2] As far as the speech sound is concerned, this definition must be expanded by stating that the source of the sound is the speech organ in which the vocal cords play the part of the sounding body. Hence, speech sounds present a physical aspect, inasmuch as they are vibrations of an elastic body transmitted through the air to a receptive organ, the ear; it is from the physicist that the linguist has to learn all about these vibrations—the conditions of their transmission, of their loudness, their strength, their frequency, their periodicity, etc. Then there is a twofold physiological aspect, since speech sounds are produced by the play of articulations and received through the functioning of various parts of the organ of hearing; in other words, their physiological character can be considered from a genetic, articulatory point of view and from a receptive, acoustic one. But that is not all. A sound does not become an element of speech unless the mind has something to do about it: for the articulations are caused by an order emanating from the central nervous system, and the sensation received by the ear is transmitted to the brain. In this sense the speech sound is to be considered a psychological product even before the question of meaning has been taken into account at all. But in both the hearer's and the speaker's mind the sounds of speech are systematically

[2] D. C. Miller, *The Science of Musical Sounds*, p. 2.

grouped as to their significant potentialities for expression and communication. This is a semeiological aspect, placing the speech sound at once at a great remove from any other sound, whether produced physiologically or otherwise. The phonetic signs of a language are psychologically held together in a system whose structure is governed by the possibilities of each sound's entering into significant combinations. As members of a semeiological system speech sounds are often called *phonemes*, and it is interesting to note that a phoneme in a given language means a number of sound varieties which are psychologically interpreted as one sound, chiefly because they are not differentiated as to their potential semantic occurrence. In English the phoneme [ɛ] represented by the vowel of *pet* occurs in a great many physical and physiological variations which are semeiologically identified as one sound as long as they do not encroach upon the domain of some neighboring phoneme like the [æ] of *pat* or the [e] of *fate*. In German the field of variability for [ɛ] in the direction of [a] is much wider than in English because the German language does not discriminate words by opposing [æ] to [ɛ].

Approaches to the Study of Speech Sounds

Speech sounds accordingly may be examined from various points of view, and our method will greatly vary as we study their physical, their articulatory, their acoustic, their psychological, or their specifically semeiological aspects. All of these are essential in the nature of speech sounds, and no phonetic study will yield scientific results unless it takes them into account together, although for classification purposes the semeiological character can be taken as a basis only if we busy ourselves with the sound system of a language in particular. As long as we are interested in general phonetics, whose principles are applicable to all languages, we can group the sounds only according to their other character-

istics. A controversy has raged with no little bitterness as to which should be considered the more important, the genetic point of view of articulatory sound production or the aspect of acoustic sound discrimination. Much has been written in favor of and against each procedure. As a matter of general information we shall give later a short survey of the arguments advanced by both sides, as this will enable the reader to see things in a better light and a more truthful perspective.[3] So far as our own attitude is concerned, we shall for various reasons stress the genetic point of view in the classification and denomination of sounds, while otherwise all their aspects will receive due attention.

Experimental Phonetics

The study of speech sounds is, of course, essentially experimental. In order to investigate their nature, qualities, and conditions of production we have recourse to various experiments: we isolate them by producing and reproducing them intentionally under various circumstances, we watch our own and other persons' articulatory movements with our inner sense of touch and with our eyes, we feel the vibrations of the air and of the glottis with our fingers, we train our ears to a fine distinction of sound qualities and of degrees of pitch, stress, timbre, tempo, etc. But in order to make up for the shortcomings of our natural senses we may also devise mechanical contrivances of registration and reproduction. By this means many features of speech, such as respiration, vibration, pitch, tempo, voice itself, etc., can be graphically represented in the form of curves and zigzags or can actually be reproduced as sounds, which may then be examined at leisure. It has become customary to call this method of study *experimental phonetics*. But the suggestion has been rightly made that such a terminology is an unjust

[3] *Cf.* page 43. See also Otto Jespersen, *Phonetische Grundfragen*, pp. 65–104.

usurpation and that a far better term would be *instrumental phonetics.*[4] The systematic use of mechanical devices is rather recent and is naturally limited to a certain type of phonetic phenomena. It easily leads into the field of mathematics, physics, or physiology. For linguistic purposes it will do to be familiar with the elements of this special branch of sound study, chiefly in order to confirm, to correct, or to define with greater accuracy certain conclusions arrived or hinted at by the other method. Phoneticians do not always agree as to the comparative importance of the instrumental and noninstrumental procedures. From a linguistic point of view we owe considerably more to the latter,[5] but the assistance that has been and may be given by the former should not be underrated.

Descriptive and Historical Phonetics

The study of sounds as they are actually current at a given time in one or more languages is called *descriptive* or *static phonetics,* as opposed to *historical, dynamic,* or *etymological phonetics,* which examines the sound changes occurring in the course of time. The line of demarcation between the two ought not to be drawn too sharply, as historical phonetics is necessarily at the same time descriptive, and sounds are pronounced alike neither by different people of the same generation nor by the same people at different moments, but are continually in the midst of a process of transformation. Every description of sounds, therefore, is also a contribution to their history.

Importance of Phonetics

It is beyond the scope of this book to show how important the systematic study of sounds is for the learning of foreign languages and for the correction of so-called defective or

[4] *Cf.* Jespersen, *op. cit.*, p. 119.
[5] *Cf.* page 179*ff.* See also Karl Stumpf, *Die Sprachlaute*, p. 8.

dialectal pronunciations of the mother tongue. For the proper conduct of linguistic studies a thorough understanding of the various aspects of phonation is indispensable. Without it the cleverest scholar is bound to make mistakes in the interpretation of linguistic facts such as sound changes and morphological transformations. An idea of the importance of phonetic training for anyone interested in linguistics may be obtained from a glance at the table of contents of almost any book on language. In recent years, it is true, more and more attention has been given to other factors in speech, such as its psychological and sociological aspects, which were long neglected in favor of phonetics. This is undoubtedly a healthy reaction against a one-sided overemphasis on the physico-physiological element in language; but it will never do to lose sight of the principles of the science of sounds, especially if we realize that phonemes partake just as much of a psychological nature as of a merely mechanical one, and possibly more.[6]

The Organs of Speech

In a general way the organs of speech may be considered as comprising all the parts of the human body that contribute, even remotely, to the production of speech sounds. The physiologist is equally interested in all of them, because each has a special function to perform; to the vocal artist it is of great importance whether his process of respiration is due primarily to muscular movements of the diaphragm or to the expansion and contraction of the chest: to him the economical distribution of breath constitutes the object of careful study and systematic training. The linguist, however, is chiefly interested in the function of those parts of the body which lie above the windpipe, because they are more immediately involved in the production of speech. This should not be

[6] *Cf.* page 39*ff.* See also Karl Meinhof, *Der Wert der Phonetik*, pp. 1–62.

understood as denying the intimate relationship between respiration, phonation, and articulation. As a matter of

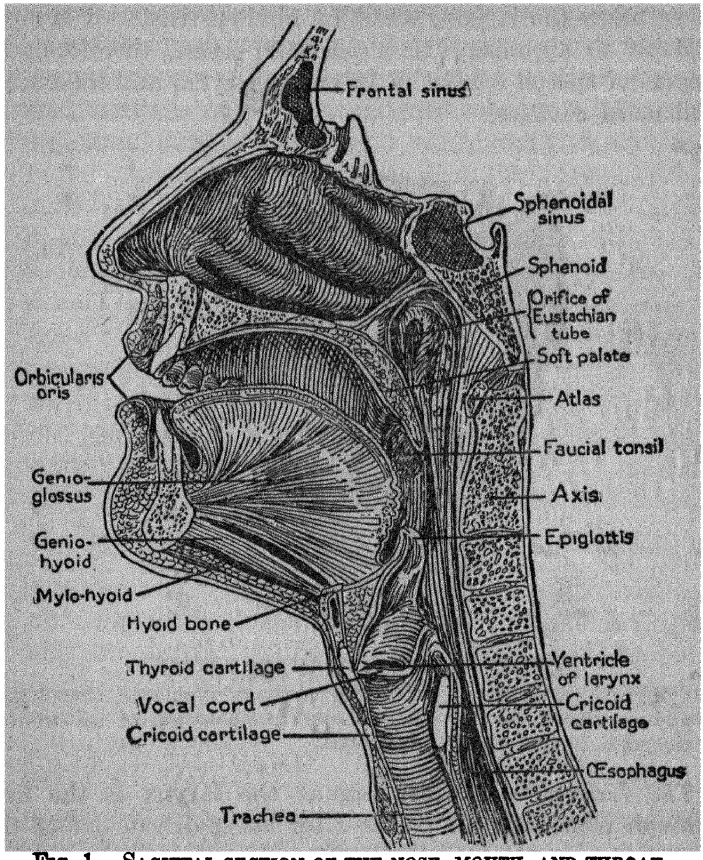

FIG. 1. SAGITTAL SECTION OF THE NOSE, MOUTH, AND THROAT

From Pillsbury and Meader, *The Psychology of Language*, after Luschka, *Der Kehlkopf des Menschen*.

fact these three phases in the speaking process influence each other continually, so that a change in one is reflected by a corresponding modification in the other. But precisely on

account of their mutual equilibrium it is permissible, for general purposes, to neglect the part of the process that takes place below the larynx, which for obvious reasons it is more difficult to appraise. In a narrower sense, therefore, the organs of speech consist of larynx, pharynx, and the buccal and nasal cavities.

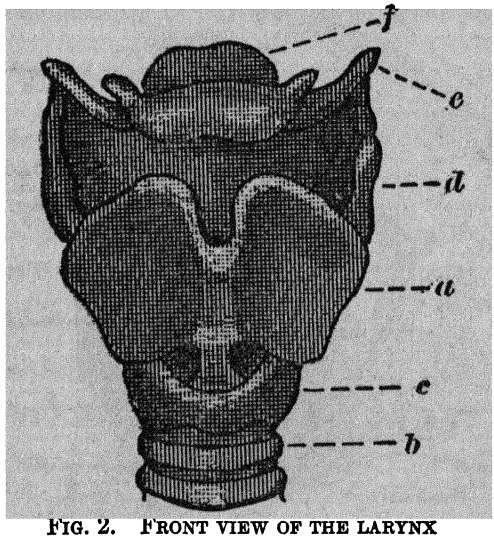

FIG. 2. FRONT VIEW OF THE LARYNX

a, thyroid cartilage; *b*, upper ring of the windpipe; *c*, ring-shaped cricoid cartilage; *d*, upper horn-shaped prolongation of the thyroid cartilage; *e*, tongue bone; *f*, epiglottis.

The Larynx.—Of these organs the larynx is the first through which the air passes after being driven out of the lungs. It consists (1) of the ring-shaped *cricoid cartilage*, the back of which is vertically larger than the front and which is placed directly on the upper ring of the windpipe; (2) of the *arytenoid cartilages*, having the shape of small three-sided pyramids the bases of which rest upon the upper edge of the back part of the ring cartilage; (3) of the shield-shaped *thyroid cartilage*, the front of which forms the so-called

Adam's apple and the back of which is open. Each face of the latter has in the rear an upper and a lower horn-shaped prolongation. The upper horns connect the cartilage with the hyoid or "tongue" bone, the lower ones with the ring cartilage. Through the supple play of various muscles the thyroid cartilage can assume different positions in relation to the other parts of the larynx; the pyramidal arytenoid

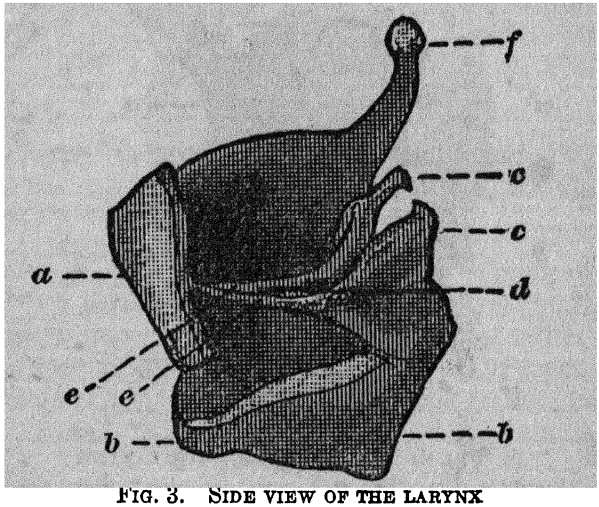

FIG. 3. SIDE VIEW OF THE LARYNX

The left side has been removed in order to show the position of the vocal cords. *a*, thyroid cartilage (front); *b*, cricoid cartilage; *c*, arytenoid cartilages; *d*, glottis; *e*, vocal cords; *f*, upper horn-shaped prolongation of thyroid cartilage.

cartilages can move around their axes and toward or away from each other. Besides, the larynx as a whole can move up and down. (4) Within the larynx are the *vocal cords*, two fleshy lips running horizontally from the back, where they are attached to the protruding bases of the arytenoid cartilages, to the front edge of the thyroid cartilage. As a result of the mobility of the different laryngeal parts just described, the vocal cords may be kept slack and, therefore,

more or less wide apart, or they may be stretched and brought close together. The space between them is called the *glottis*. The larynx is covered by a sort of lid, the *epiglottis*, which is lowered during the action of swallowing. It appears from recent studies that the epiglottis plays a distinct rôle in the formation and differentiation of speech sounds. By being

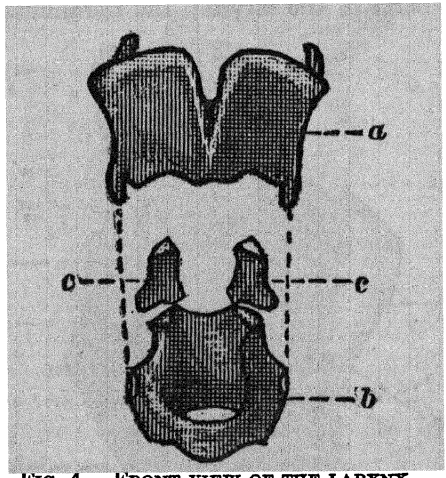

FIG. 4. FRONT VIEW OF THE LARYNX

The thyroid cartilage has been raised in order to show the form and position of the cricoid and arytenoid cartilages. *a*, thyroid cartilage; *b*, cricoid cartilage; *c*, arytenoid cartilages.

lowered and thus covering the glottis with its fleshy substance it has a muffling influence upon the quality of vowels.[7]

The Pharynx.—The pharynx is a cavity situated between the epiglottis and the mouth. Its function in speech was long ignored but is today recognized as of great importance.[7] Its shape varies considerably in the pronunciation of different vowels, and by thus changing its resonating capacity it modifies the laryngeal tones accordingly.

[7] See G. Oscar Russell, *The Vowel*, pp. 122*ff*.

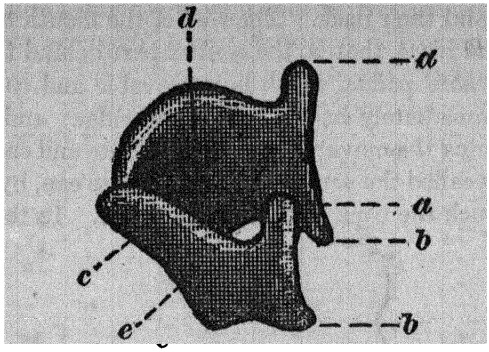

FIG. 5. SIDE VIEW OF THE THYROID CARTILAGE

a, upper horn-shaped prolongations; *b*, lower horn-shaped prolongations; *c*, front; *d*, right side; *e*, left side.

The Mouth.—The cavity of the mouth is bordered by more or less flexible and movable walls and contains one of the most important organs of sound production, the tongue. For phonetic purposes it is necessary to distinguish the following parts of the mouth: the lips, the teeth, the roof, and the tongue. In regard to the teeth we may distinguish

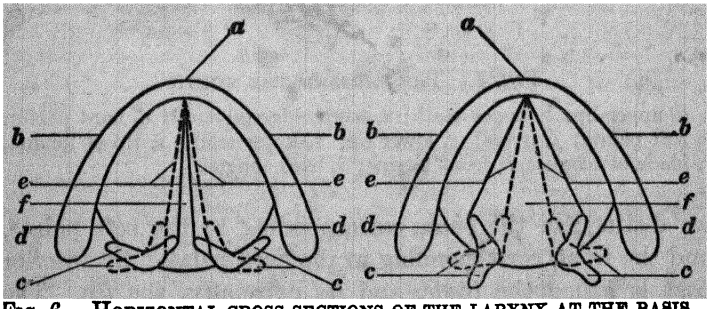

FIG. 6. HORIZONTAL CROSS SECTIONS OF THE LARYNX AT THE BASIS OF THE ARYTENOID CARTILAGES

The dotted lines within the figures explain the various movements and positions of the arytenoid cartilages and of the vocal cords. *a*, front of thyroid cartilage; *b*, sides of thyroid cartilage; *c*, arytenoid cartilages; *d*, cricoid cartilage; *e*, vocal cords; *f*, glottis.

their edge and their back. The roof of the mouth is divided into the *teeth ridge*, that is, the convex part behind the upper teeth; the *hard palate*, which is immovable and constitutes the part immediately back of the teeth ridge; and the *soft palate*, forming the movable part of the palate and ending in a fleshy body called the *uvula*. The soft palate can, by moving upward, touch the back wall of the pharynx. In the tongue

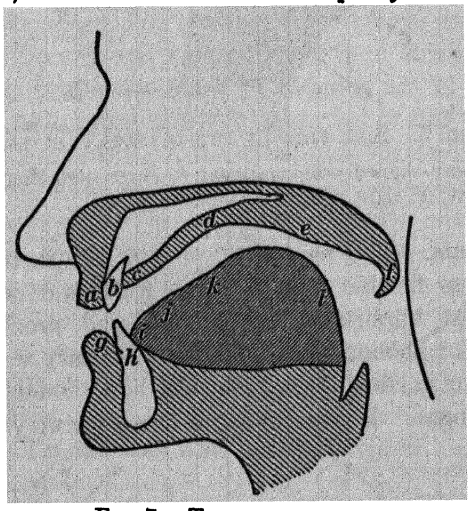

FIG. 7. THE PARTS OF THE MOUTH

a, upper lip; *b*, upper teeth; *c*, teeth ridge (alveoli); *d*, hard palate; *e*, soft palate; *f*, uvula; *g*, lower lip; *h*, lower teeth; *i*, tip of tongue; *j*, blade of tongue; *k*, front tongue; *l*, back tongue.

we distinguish the *back*, corresponding to the soft palate, and the *front*, corresponding to the hard palate; its anterior part is called the *blade*, and its extremity, the *tip*. The buccal cavity can assume a great many different shapes according to the movements effected by the lips, the soft palate and uvula, the jaws, and the tongue.

The Nose.—The nose forms a cavity the shape of which remains essentially constant. By means of the downward

and upward movement of the soft palate and uvula the passage between the larynx and the nasal cavity can be entirely or partially opened or closed.

Breath, Voice, and Whisper

When we breathe, the glottis is wide open and allows the air to pass without obstruction (*breath*). If the vocal cords are stretched, the air coming from the lungs has to be pressed through with greater or less force, in consequence of which the vocal cords and the air above are caused to vibrate. According to the number of these vibrations in a second (*frequency*) and to the range of the vibrations on one side or the other from the middle point of the motion (*amplitude*) musical tones are produced of varying pitch and strength known by the general name of *voice*. *Whisper* in the phonetic meaning of the word is produced either by leaving a small section of the glottis sufficiently open for the passage of the air without there being any noticeable vibrations, or else by allowing the breath to escape through the space between the two pyramidal cartilages while the glottis remains entirely closed. In ordinary usage the word "whispering" is synonymous with "speaking low but with voice."

Tones and Noises

The vibrations that produce sounds are either regular and periodical or irregular, and it is often said that in the first case the result is a *tone*, whereas in the latter the effect will be a *noise*. However, this seems contradicted by the facts. "Analysis clearly shows that many so-called musical tones are nonperiodic and it is equally certain that noises are as periodic as are some tones. In some instances noises are due to a changing period, producing the effect of nonperiodicity; but by far the greater number of noises which are continuous are merely complex and only apparently irregular,

their analysis being more or less difficult."[8] A tone is a musical sound whose structure is not too complex to be analyzable by the ear and to make it distinguishable from another musical sound. "A noise is a sound of too short duration or too complex in structure to be analyzed and understood by the ear."[9] Speech consists of a succession and combination of tones and noises.

Differentiation of Speech Tones

If the tones that we have defined as voice were to be transmitted to our ears directly as they leave the larynx, they would differ as to their pitch and intensity, but there would be hardly any difference in coloring or quality. In other words, there would be mainly one tone of a rather indefinite quality, but no distinction could be made between such sounds as [a], [e], [i], [o], [u]. This distinction is not produced by the vocal cords; it is the result of the various cavities within and above the larynx acting as resonators.

The vibrations that produce a musical sound are compound, that is, they consist of a certain number of component tones of various intensities and frequencies whose combination creates the general impression of a single sound. The individual components are called *partial tones;* the one that has the lowest frequency is the *fundamental,* while the other partials are known as the *overtones.* Usually the fundamental is the stronger and prevails so as to determine the pitch of the tone as a whole;[10] the other partials are ordinarily weaker, but higher in pitch. If the frequencies of the overtones are exact multiples of the frequency of the fundamental, they are called *harmonic partials;* otherwise they are *inharmonic.* Fundamental tones sound considerably weaker by themselves than when they are accompanied by a certain number of partials.

[8] Miller, *op. cit.,* p. 22. [9] *Ibid.*
[10] *Cf.* Stumpf, *op. cit.,* p. 301.

The peculiar quality or coloring of a compound tone depends upon the number, the intensity, and the pitch of the overtones. A definite volume of air, however, vibrates more or less easily according to the frequency of the vibration. Its natural period is that which corresponds to the frequency at which it vibrates with greatest ease and force. If the natural period of a volume of air coincides with the frequency of a certain partial in a musical sound, the air volume concerned covibrates sympathetically and reinforces the corresponding partial tone to the exclusion of the others. The result is that the compound tone acquires a different acoustic quality. Such definite volumes of air may be inclosed in receptacles, open on one or both sides, which are called *resonators*. Each resonator will reinforce one or several particular partials according to its shape and the volume of air that it holds. In the process of speech the part of resonator is played by the cavities within and above the larynx, manifold variations in the shape and size of the chambers being continually produced by various articulations.

The quality of a speech sound, therefore, is dependent upon the particular shape of these cavities and the contained volumes of air which by their sympathetic vibrations modify the sound as a whole. According to von Helmholtz (1821–1894), "each vowel is characterized, not by a single pitch, but by a fixed region of resonance, which is independent of the fundamental tone of the vowel; this is the so-called fixed-pitch theory. In opposition to this many writers on the subject have held that the quality of a vowel is characterized by a particular series of overtones accompanying a given fundamental, the pitches of the overtones varying with that of the fundamental, so that the ratios remain constant; this is the relative-pitch theory."[11] "Hermann

[11] Miller, *op. cit.*, p. 216.

(1889) has suggested that the vowels might be characterized by partial tones, the pitches of which are within certain limits, but which are inharmonic, the partials being independent of the fundamental."[12] However this may be, it is easy to see how important the articulations of the tongue, lips, soft palate, etc., are, since they continually modify the resonant cavities and produce a number of successive resonators with varying sympathies. Attention has also been drawn to the effect of hard and soft resonance walls upon the quality of a tone: the hard palate and other bony parts of the speech mechanism bring out the higher overtones and render the compound sound more metallic; soft substances damp the higher partials and endow the tone with a softer, more mellow quality.[13]

Differentiation of Speech Noises

Of course, in order to have tones at all it is essential that there be voice; in other words, the vocal cords must vibrate. Besides, in referring chiefly to vowels in the above paragraphs we have assumed that the various shapes of the superlaryngeal cavities do not prevent the air from flowing easily all the way through. But many sounds of speech may be produced with open glottis and a hampered flow of air above it. In that case we hear no voice but merely breath, or, rather, what has been previously described as noise. This may be the result of an audible *friction* caused by forcing air through a very narrow passage, such as is formed by the bringing together of various parts of the buccal or other cavities—for instance, of the two lips, or one lip and the teeth, or some part of the tongue and the palate, etc. Besides friction, a noise may also result from a total closure followed by a sudden opening of the air passage at some point of the speech cavities. The noise heard will then be a little *explosion* in consequence

[12] *Ibid.*
[13] *Cf.* Russel, *op. cit.*, pp. 122*ff.*

of the sudden releasing of the air. All noises, whether produced by explosion or by friction, are often distinguishable from each other according to their particular place and manner of production. Thus, besides determining the characteristic qualities of tones, the speech cavities are also instrumental in the differentiation of noises.

Vowels and Consonants

These two types of sounds, tones and noises, may be combined so as to form a third variety which possesses voice and audible friction or explosion at the same time. The position of the parts of the speech mechanism necessary for the production of the noise in question will naturally set limitations to the shaping of the resonant cavities required for the production of varying tone qualities. Although noises produced with voice are able to assume certain colorings of tone, the latter are less variegated and more indefinite than is the case with noiseless tones. Hence the difference between vowels and consonants may be formulated as follows: *Vowels* are sounds which consist of voice modified by sympathetic vibrations in the superlaryngeal cavities and in the production of which the air is allowed to flow through freely, with no, or hardly any, friction. *Consonants*[14] are either pure noises, that is, sounds produced by mere friction or explosion, without any voice at all, or noises accompanied by voice but in which the friction or the explosion is distinctly predominant. Consonants of the former type are said to be *voiceless, breathed, surd,* or *breath* sounds; those of the latter type are termed *voiced, sonant,* or *vocal.*

Whispered Vowels

The above formulation assumes that voice is essential in the production of a vowel. Generally speaking this is quite

[14] *Cf.* page 56.

true, at least as far as spoken language is concerned. But outside of speech, and exceptionally also in certain spoken languages,[15] it is possible to utter very distinctly whispered vowels "without the production of any larynx tone, that is, without fundamental or pitch and without the series of partials which determine the individuality of the voice. . . . These whispered sounds must contain at least the essential characteristics of the vowels,"[16] inasmuch as the air of the resonating cavities required for the normal pronunciation of the vowels concerned is made to vibrate independently at its natural period or periods.

Continuants and Explosives

If the mode of noise production is friction, we call the resulting sound a *fricative*, a *spirant*, or, since the flow of air may be maintained continuous for some time, a *continuant*. Consonants with accompanying explosion are generally designated by the name of *explosives*. The explosion, however, is not their only or even their essential feature. If we pronounce [p] or [b] as isolated sounds, we clearly distinguish three stages in their production. First the air is driven from the lungs into the upper parts of the speech organ until its flow is checked by the complete closure of the lips; this stage is that of implosion, during which we either hear nothing, as in the case of voiceless [p], or a little voice of variable duration and intensity, as in the pronunciation of the sonant [b]. Then comes the actual stopping of the air passage, during which the breath under pressure is con-

[15] For instance, as a result of the final accent in French a final [i] or [u], when considerably stressed, sometimes loses its voice and becomes whispered or breathed: "il n'est pas ic(i)," "ce n'est pas beauc(oup)." For other examples see the long Paiute (American Indian) word in Edward Sapir, *Language*, pp. 31, 52; and Stumpf, *Zur Analyse geflüsterter Vokale*, p. 151, *Die Struktur der Vokale*, pp. 333–58, and *Die Sprachlaute*. See also on page 51 of this book.

[16] Miller, *op. cit.*, p. 235.

densed and insists upon escape; this temporary stop in articulation has suggested the name of *stops* as synonymous with explosives. And finally, in the third stage, the air escapes with a puffing noise accompanied or not by voice. But in a combination like "up to date" the [p] of *up* contains the first two stages of production and lacks the third, whereas the [t] of *to* wants the implosion and contains both stop and explosion. Hence some phoneticians have resorted to the name of *implosives* in order to characterize the type of sound represented by the [p] of *up* in the above combination. Collectively, both the sounds without explosion and those without implosion are sometimes designated by the name of *plosives*. But even this term would not cover the type shown in the [t] of such a word as *aptly*, where we have neither im- nor explosion but only a stop. Besides, in a combination like [apa] the implosion as well as the explosion is taken up by the pronunciation of the vowel [a]; they are nothing but the transition from the vowel to the stop or from the stop to the vowel. In this book we shall use the terms *explosives* or *stops* indiscriminately for any of the varieties mentioned, but it is important to observe that the mode of production of the same type of sound sometimes varies considerably, according to the surrounding phonemes of the combination in which it occurs.[17]

Liquids

Until now we have considered only those consonants in which friction is produced by a narrowing of the air passage, and explosion by one complete closure followed by one sudden opening. But the formation of [l] reveals a new mode of noise production inasmuch as the front tongue actually establishes contact with a section of the upper region of the mouth without blocking the air. The stoppage, instead of

[17] For this and various other processes see our analysis of a speech curve, page 60.

being complete, affects only part of the surfaces of articulation, so that the stream of air is allowed to escape at one or at both sides. Such phonemes go by the name of *lateral* or *side* consonants. On the other hand, the [r] sound is often formed by means of a rapid succession of taps of the front tongue against the teeth ridge or of the uvula against the back of the tongue, in which case we have several explosions instead of one. The resulting effect is that of a trilling or rolling noise, which has caused such sounds to be classified as *trilled* or *rolled* consonants. Lateral and rolled sounds are sometimes collectively called *liquids*.

Nasals

Aside from this trilling function, the uvula and the neighboring region of the soft palate play another important part in sound production: they may be made to touch the wall of the pharynx, thus shutting off the nasal cavity, or their lowering may permit the air to stream through the nose. If there is a free passage between nose and larynx, the vibrations of the glottis are communicated to the air in the nose so that the effect is a strongly nasalized sound. This will be a vowel, as [ã] in the French word *dans*, when both mouth and nose allow the air to escape; it will be a consonant, as, for instance, [m] or [n], when the buccal passage is temporarily blocked.[18] A certain degree of nasalization is compatible with even a complete isolation of the nasal cavity. Speech curves often show clear nasal vibrations in the registration of sounds which are not produced by a lowering of the soft palate or uvula. That in such a case no breath streams through the nose is evidenced by the fact that the kymographic curve does not deviate from the zero line. The laryngeal vibrations are simply communicated to the air in the nose across the bony and fleshy substance of palate and uvula.

[18] See the analysis of a speech curve, page 60.

Open and Closed Vowels

A classification which has been subjected to severe criticism lately is that of the vowels into *open* (*high*) and *closed* (*low*).[19] The traditional point of view was that for the pronunciation of [ɑ] the mouth had to be more open and the jaws wider apart than for the production of [e] or [o], and still more so than for the formation of [i] or [u]. The degree of mouth opening itself was considered to be a result of the degree of tongue arching, so that open vowels were those for whose production the tongue was not much raised toward the palate, whereas for closed ones a considerable arching of the tongue was required. Compared with the extremely open vowel [ɑ] of *father* and the extremely close [i] of *flee* and [u] of *you* the intermediate sounds [e] of *say* and [o] of *hope* were deemed to be neither close nor open. They were called *mid-vowels* or *half-closed*, as against their *half-open* neighbors [ɛ] of *fair* and [ɔ] of *jaw*. The distinction between open and closed was used also in order to discriminate between varieties of the same vowel type, such as the open [ɪ] of *fill* and the closed [i] of *flee*. The terminology here referred to is still very widely used and probably will continue to be in the future, in spite of the drawbacks that it may present.

Tense and Lax Vowels

Sounds are differentiated also according to the degree of muscular tension to which that part of the tongue is subjected which is raised the farthest in the direction of the roof of the mouth. The muscles of the front tongue are more stretched in the pronunciation of [i] in *flee* than in that of [ɪ] in *fill*. The former vowel is called *tense*, the latter *lax* or

[19] *Cf.* Russell, *op. cit.*, pp. 317*ff.*, and Eduard Prokosch, "The Germanic Vowel-Shift, etc." in *Studies in Honor of H. Collitz*, pp. 71*ff.* See also on page 27 of this book.

loose. As a rule, a tenser sound is at the same time more closed, a laxer one more open. It generally happens that a vowel whose pronunciation is tense when it occupies an accented position becomes lax when it is unaccented.

Rounding

We have seen that the particular tone coloring of a sound with voice depends upon the different resonance chambers above the glottis. Modifications of these resonators are conditioned not only by the various articulations of the tongue and other movable organs within the mouth or throat, but also by the changing positions of the lips. Sounds of identical articulation as regards the other organs of speech will possess very different acoustic qualities according as the lips are held in a natural or neutral position, or spread out so as to leave a long, narrow opening between them, or protruded and drawn together so that the opening between them is more or less round, as in the act of whistling. An example of a vowel obtained with spread lips is [ɪ] of *fill,* and such sounds are generally called *unrounded.* A vowel pronounced with protruding lips is, for instance, the [o] of *hope* or, more distinctively, the [y] in the German word *süss;* they are said to be *rounded.* The process of lip rounding is also known by the name of *labialization,* while a synonym of unrounding is *delabialization.*

Regions of Articulation

According to the particular section of the mouth toward which the articulating tongue is raised or the place where a narrowing or a closure is established, we are able to elaborate still further the description of speech sounds. Such points may be situated anywhere between the lips and the pharynx, nay, even within the larynx itself. Theoretically, to every point of articulation corresponds a sound which differs, albeit hardly perceptibly, from that which is produced at

a point immediately contiguous, provided that all the other articulatory movements are identical. But it is doubtful that this ever occurs in reality, because a change in the position of one part of the speaking organs is likely to be reflected by a corresponding change in others. It is quite possible for the same sound to result from different articulations, because one change may be compensated by another so that the resultants are identical.[20] This seems to be especially true when we examine the vowels. It has been found that the same [a] sound can be obtained with a number of tongue positions and jaw articulations; simultaneous changes in other parts of the speech mechanism produce such general resonating conditions that the same vowel quality is obtained, at least as far as can be determined by the ear. The position of the tongue in vowel articulations is very fluctuating indeed,[21] and it is impossible to define it completely and accurately for any particular vowel. However, it may be said that in ordinary pronunciation [i] and [u] are formed by a considerably higher raising of the tongue toward the hard or soft palate than [a], and that between [a] and [i], or [a] and [u], there lie a certain number of intermediary vowels whose articulation is very unstable. As for the consonants, it is much easier to determine their place of articulation because of the closer contact of the active organs. But here, too, absolute accuracy of description is an elusive and unattainable ideal. In practice we must content ourselves with an approximation, the degree of which will largely depend upon the end in view. For this reason we base our classification upon more or less extensive regions in which many varieties of the same type of sound are articulated. The names that are thus given to sounds have collective meanings; their values are varying,

[20] *Cf.* J. Gutersohn, *Beiträge zu einer phonetischen Vokallehre*; also Russell, *op. cit.*, p. 131.

[21] *Cf.* page 25.

not only from one language to another, but also according to the surroundings in which they are used in the same idiom by the same individual. The [k] in Engl. *cool* is in reality quite different from that in Engl. *kin*, the latter's point of articulation being more forward on account of the influence of the following front vowel [ɪ]. Yet we generally classify both varieties under the same heading, unless special circumstances demand greater exactness.

Articulatory Classification of Speech Sounds

The classes of sounds that are traditionally distinguished from the point of view of such regions of articulation may be given as follows:

A. CONSONANTS

1. *Bi-labials*, sounds articulated by the two lips, as [b], [m], [w].
2. *Labio-dentals*, sounds produced by the lower lip articulating against the upper teeth, such as [f], [v].
3. *Pre-dentals*, articulated by the tip or blade of the tongue against the teeth, for example, English [θ], French [t].
4. *Post-dentals* or *alveolars*, produced by the tip or blade of the tongue against the alveoli or teeth ridge, for instance, [z], [s], the English [t].
5. *Palatals*, produced by the front tongue against the hard palate, such as [j].
6. *Velars*, articulated by the back tongue against the soft palate, such as [g], [k]. The shifting of velar sounds in the forward direction of the hard palate under the influence of surrounding palatals is known by the name of *palatalization*.
7. *Uvulars*, produced by the back tongue and the extremity of the soft palate or uvula, as in the pronunciation of [r] by most Frenchmen and Germans.
8. *Laryngeals* or *glottals*, produced by a narrowing or closure of the vocal cords. A slight narrowing will result in the voiceless fricative [h], and a closure followed by a sudden opening will yield the so-called *glottal stop* or *glottal catch*, not written in ordinary spelling but phonetically represented as [ʾ]. It is very common in the pronunciation of German initial vowels.

B. Vowels

The points of articulation for vowel classification do not cover such a large number of sections. The chief distinctions in use here will comprise:

1. *Front vowels*, produced by a rise of the front tongue toward the hard palate, as in the pronunciation of [i] in *flee* or [e] in *day*.
2. *Back vowels*, for which the back tongue rises toward the soft palate, as in the case of [u] in *you* or [o] in *hope*.
3. *Mixed vowels*, produced if the raising of the middle tongue is directed toward the middle region of the palate, as in [ə˙] of *bird*. In a different sense [y] of *süss*, [ϕ] of *schön*, and [œ] of *Köpfe* are sometimes called mixed vowels, because their articulation and acoustic qualities were thought to be mixtures of back and front vowels.[22]

Speaking by Inspiration

As a rule, speech sounds are produced by glottal vibrations or by noises caused by the "outstreaming" air. But occasionally the air breathed in is used in speaking, as may happen when we pronounce "yes" or "no" or other short expressions, especially of an interjectional character ("ah," "hm," etc.). In longer stretches of speech, when for some reason we do not care to lose any time through inspiration or to interrupt the periodical alternation of breathing, the same phenomenon is to be observed. Similarly, a cashier who counts bills or adds figures does so rhythmically, all numbers being uttered at equal intervals or in equal groups; in this manner there arises a psychological relationship of interdependence between the intervals and the successive figures added, so that a pause caused by inspiration would upset the rhythm and easily lead to confusion. Speaking by inspiration, however, is unusual, for the simple reason that the air breathed in cannot be so economically distributed over longer spoken contexts; the empty lungs demand too emphatically a quick renewing of air.

[22] This terminology is not commendable.

Clicks

Aside from this genuine kind of speech by inspiration, there are certain voiceless sounds, called *clicks*, which are independent of breath whether inspired or expired. They are simply the result of a suction produced by the action of two speech organs, such as the two lips, or the tongue and the upper parts of the mouth or throat, etc. The smacking of a kiss is a bi-labial click; as a sign of discontent we often produce the dental click "ts," etc. Clicks, of course, cannot be voiced; as soon as the vocal cords are caused to vibrate, there must be more than suction, namely, regular inspiration. They are rather of the explosive than of the fricative type, since the suction in question cannot be kept up as long as the friction of a genuine continuant. In some primitive languages clicks are used as characteristic sounds.[23]

Boundary between Vowels and Consonants

If we compare the [ɑ] sound of *father* with the [p] of *pen*, we find that so far as the degree of mouth closure is concerned, they form two extreme modes of articulation: [ɑ] can be pronounced with the greatest mouth opening possible, whereas [p] requires complete closure. Between these two extremes there are a great number of other sounds for which the mouth opening will be smaller than the largest possible and larger than the smallest possible, that is, complete closure. Obviously, vowels can be uttered with a greater opening than consonants, since the latter require either friction or explosion. As for the vowels themselves, the maximum opening for [i] and [u], because of their high tongue arching, will be smaller than the maximum opening for some other vowels. If now we gradually raise the tongue from the [i] position to an increasingly higher one, the narrowing will eventually

[23] For instance, in Hottentot, Bushman, some Bantu dialects, and several American Indian languages. *Cf.* pages 430, 432.

reach the point where a clearly distinguishable friction is heard with a considerably less pronounced vowel quality. This will be a sound resembling [ç] of Germ. *ich* or the initial fricative of the English word *huge*. In other words, we shall have passed unnoticeably from the series of vowels into that of consonants. The distinction between the two is one of degree rather than of quality. This is true not merely from an articulatory point of view, but also if we emphasize the acoustic aspect. Vowels are accompanied by noises and noises by tones, and it is not possible to state exactly where noise is beginning or ceasing to predominate. From the definitions given above it is easy to diagnose [e] as a vowel and [s] as a consonant, but it is impossible to ascertain the exact articulatory or acoustic condition that ends the series of vowels and that with which the consonant series sets in. Between the [i] of *flee* and the [ç] of Germ. *ich* lies a neutral zone in which, at least from our present point of view, sounds of a dubious character are produced which have been christened by the name of *semi-vowels*.[24] It matters not whether they are produced in the front or in the back section of the mouth as long as their articulation takes place in such a neutral zone between vowels and consonants and as long as, from an acoustic point of view, the relative importance of friction and tone cannot be easily appraised. Typical semi-vowels in English are [ɪ] and [ʊ], as the second elements of diphthongs as in *lie* and *low*. Because of their character it is not surprising to find them treated as vowels by some and as consonants by others. In the history of a given language they easily become regular consonants or genuine vowels.

Affricates

Intermediate zones of articulation and acoustic qualities are found not only between the vowel and the consonant

[24] *Cf.* page 70.

series, but between every two typical sounds over the entire distance covered by the rising tongue from the open [ɑ] position to the closed pronunciation of a stop. In the vocal field nobody will mistake an [ɑ] for an [o], but between the two there are countless varieties, some of them radiating around the [ɑ] type and some around the [o] type. The exact line of demarcation between [ɑ] and [o] can no more be determined than that between vowels and consonants. The same gradation exists in spirants as compared with stops. In the uttering of explosives the release of the outstreaming air may be very sudden, resulting from a complete and wide opening immediately after the stop, or the separation of the blocking organs may be slow and gradual, so that the closure is followed by a narrowing and the explosion transformed into a friction. We thus obtain sounds of a hybrid character, partaking of the nature of explosives inasmuch as they have implosion and a short stop, and of the nature of spirants because they possess friction. Such combinations of stop and homorganic fricative, known by the name of *affricates*, are frequent in German and other lan guages. An example of a German affricate is the [pf] of *Pfuhl*, as against the initial stop in the English *pool*; our own word *church* begins and ends with the affricate [tʃ].

Aspirates

A stop followed by a vowel, as in the combination [papa], may be uttered in such a way that the vowel sets in immediately after or at the same time as the explosion; but we may also allow pure breath to escape for a while between the explosion and the beginning of the vowel, without allowing a narrowing to cause friction. The effect of such a pronunciation is that the stop is followed by a more or less audible [h] sound, and instead of [papa] we hear something like [pʰapʰa]. These stops characterized by breath subsequent to explosion are called *aspirates* and are common in Denmark,

North Germany, and elsewhere. They are intermediate between pure explosives and affricates.

Transition from Voice to Breath; Lenes

Nor does the distinction between voiced and voiceless exhibit the clearness of sharply defined contours. If we examine a speech curve,[25] we can notice distinctly that the passage from breath to voice or vice versa often takes place so gradually that the exact separation of the two is quite difficult to determine. In a word like *five* the initial fricative may be kept voiceless until the following vowel begins, so that the closing of the vocal cords coincides with the end of the friction. As a rule, however, the shutting of the glottis is gradual, and voice sets in before the articulation of [f] has come to a close; the pronunciation of [f] will then be voiceless at the beginning but sonant at the end. Generally speaking, a surd consonant is uttered with a more energetic stoppage or constriction and consequently with greater force of superlaryngeal expiration than a sonant. This is seen to be quite natural if we remember that in the latter case the breath is allowed to pass into the superlaryngeal cavities only by intermittences caused by the vibrating vocal cords. Even if we assume that the subglottal force of expiration is the same in both instances, on leaving the larynx its strength is broken and considerably weakened as a result of the resistance offered by the closed vocal cords. But here, too, intermediate stages will occur, especially between voiced and voiceless explosives. In Denmark and South Germany, for instance, the distinction between [b] and [p] is not produced by the presence or absence of voice; though both are pronounced with open glottis, [p] is characterized by a tenser lip articulation and a more powerful air pressure than [b].[26]

[25] See the speech curve on page 60.

[26] *Cf.* E. W. Brücke, *Physiologie und Systematik der Sprachlaute*, p. 77: "In Süddeutschland existieren eine Menge von Spässen und Wort-

Sounds of the latter type are given the name of *lenes* and may be described as lax or loose voiceless stops. A South German [b] or [d] will impress a Frenchman or an Englishman as [p] or [t], because neither the French nor the English are aware of using such sounds in their languages.

Liquids and Nasals as Vowels or Consonants

In nasals and liquids we observe a similar condition. Although they are generally accompanied by voice, voiceless [m], [n], [ŋ], [l], and [r] are not only possible but are in frequent use in several languages and dialects.[27] Even in English surd surroundings will sometimes cause these sounds to lose part of their voice, either at the beginning or at the end of their articulation. Conversely, the nasalization of [m], [n], or [ŋ] is often partly communicated to an immediately preceding or following sound, which means that the lowering of the soft palate is not quite synchronized with the end or the beginning of the nasal. In a word like *soon* the latter part of the [u] sound is apt to be slightly nasalized before the following articulation begins. A negligent pronunciation even produces a regular nasal vowel after dropping [n] entirely in a combination like "I don't want to", which often sounds [aɪdõwɔ·ntu][28]. In some people's speech a slight amount of nasalization is present continuously, either because they are in the habit of leaving the soft palate somewhat removed from the back of the throat or because the vocal vibrations are communicated to the air of the nasal cavity in spite of and across the obstructing soft palate and uvula. Such an habitual mode of nasalized pronouncing is known by the name of *twang*.

witzen, die auf der Verwechslung von sogenannten harten und weichen Lauten beruhen."

[27] Voiceless nasals and liquids occur as regular sounds, for instance, in Welsh and in a number of American Indian languages. In the French *peuple* the [l] sound is voiceless; in the English *people* it is voiced.

[28] *Cf.* page 122 and the speech curve on page 60.

From an acoustic point of view nasals and liquids are likely to strike the ear as being more sonorous and possessing more distinct vowel coloring than ordinary fricatives or explosives pronounced with an equivalent amount and force of breath. The reason for this is that in the uttering of sonant [v], for instance, the air has to overcome at first the resistance of the stretched vocal cords and then that of the constriction between the lower lip and upper teeth, whereas the latter resistance does not occur in the pronunciation of the nasals. With them the nasal cavity permits the air to escape freely and to covibrate sympathetically, so that the element of friction does not so much obscure their sonority. For a similar reason [l] will be more sonorous than [v], since the buccal resonator is open at one or at both sides of the articulating part of the tongue. As for rolled [r], the quick succession of taps is equivalent to a quick succession of openings of the resonance chamber.

This peculiarity of greater sonority of nasals and liquids often causes them to play the part of vowels or semi-vowels. In Indo-European there was a regular set of diphthongs in which nasals and liquids were the second elements (*el, er, em, en*), and in the second parts of the German words *Gabel, senden,* or of the English word *little* the syllabic function of indefinite [ə] has been entirely taken over by [l] or [n]. It is not surprising, therefore, that both nasals and liquids are very apt to become entirely vocalized or at least to develop a vowel, generally [u] or [o], beside them. Compare Du. *oud* with Engl. *old,* Fr. *chaud* with Lat. *calidus,* Lat. *pl(enus)* with Engl. *full,* Skr. *tṛ̆nam* (' blade of grass ') with Engl. *thorn,* I.-E. *k̑m̥tóm* with Engl. *hund(red),* It. *fiore* with Lat. *florem.*

Sounds in Connected Speech; Glides; " Svarabhakti " Sounds

In the preceding paragraphs we have drifted little by little from the consideration of single sounds into that of

phonetic groups. Only seldom does a sound by itself constitute a psychological unit of speech, as happens in the interjections "eh," "oh," "ah." Even when this does occur, the sound takes over the intonation of a sentence and is thereby modified. Normally, speech is attained through one or more sound combinations, each uttered in one expulsion of air economically distributed over the various parts of the combination. It goes without saying that under these circumstances we do not separate each sound from its neighbors by each time bringing the articulating organs back to their normal position of rest. But if the various parts of our speech mechanism move from one position to another without there being any discontinuation in the passing of air, there must result a number of transitional sounds between every two distinct articulations. Most of these *glides*, as they are called, are quite, or almost quite, inaudible, yet they exist and eventually are responsible for important phonetic changes. Especially is this true if two successive articulations are of such a character as to make a quick passage from one to the other difficult. The tongue position required for [l], [r], or [n], for instance, cannot be reached easily after the articulation of [k] or [g] without there arising between the two heterogeneous articulations a very audible glide or even a sound of distinct individuality. Although in standard German no such distinct sound should be heard between [g] and [l] in *Glas*, or [g] and [r] in *Gras*, or [k] and [n] in *Knecht*, a slovenly or dialectal pronunciation often gives [gəla·s], [gəra·s], and [kəneçt]. Such glides, which are also called "*Svarabhakti*" *sounds*, may come to stay and be regarded as correct by the speaking community. In France the people say incorrectly " ouvérier "[29] instead of " ouvrier," but in *canif* (= A.-S. *cnif*) the [a] is a glide which has become recognized as necessary for a good pronunciation of the

[29] *Cf.* Ferdinand de Saussure, *Linguistique générale*, p. 94.

word. In the English combination " very often " we distinctly hear a [j] sound between the two words.

Sandhi Rules

An inevitable consequence of connected sound production is the reciprocal influence that phonemes exert upon one another. We have had several occasions to illustrate this in the foregoing paragraphs, and other illustrations will be given later when we come to deal with the various features of linguistic change. Suffice it now to add that the influence of sounds upon one another is not the same in all languages, in all positions, with all individuals, or at all times. This holds true for the degree as well as for the character of the influence. Although it is impossible completely to keep sounds from being affected by their surroundings, some individuals or languages reduce this mutual action to a minimum by a very distinct and discriminating articulation. The jerking pronunciation of German initial vowels establishes a separation between them and the immediately preceding phonemes. Such vowels, therefore, will be considerably less influenced by what precedes than is the case in languages that do not use the glottal stop. For instance, in the combination " in America " pronounced by an Englishman the initial vowel of *America* is likely to participate at the beginning of its articulation in the nasalization of the preceding [n], whereas a German will carefully avoid the carrying over of this nasalization. In Dutch pronunciation [d] loses its voice when it is immediately followed by a surd: in the phonetic groupings " rood haar," " rood kleed," the [d] of *rood* is voiceless, whereas before [b] or [d], as in " rood dak," " rood bloed," it is a sonant. In English, on the contrary, [d] remains voiced whether followed by a surd or a sonant, as can be gathered from the pronunciation of "red blood," "red hair," "red color." In this respect every language has its own customs and rules of sound influences

which no foreigner who attempts to acquire a good pronunciation of the language can afford to ignore. In many cases knowledge of these laws will help us to understand important phonetic changes. In German the velar fricative [χ], as in *Nacht*, when preceded by a palatal vowel is palatalized into [ç], as in *Nächte*; and in French a similar process accounts for the change of [k] into [s] as in *cent* from Lat. *centum* (*c* = *k*). The rules that govern the reciprocal influence of sounds in the various languages are sometimes called *Sandhi rules*, from the Indian word *Sandhi*, 'connection.'

Sound Systems

It is unnecessary to insist upon the fact that the possible number of speech sounds is unlimited. This follows from the possibility of combining many different manners and places of articulation, of blending many shades of tones and of noises, and of varying infinitely pitch, intensity, tempo, etc. Yet each language has its own sound system, with a limited number of characteristic phonemes sufficiently distanced from each other physiologically, acoustically, and psychologically to be clearly discernible as distinct sounds and to allow, at the same time, for a greater or smaller number of related varieties. What is regarded as a variety or even a glide in one language may act as a distinct sound in another. Whereas the glottal stop is occasionally used in English as a means of emphasizing a certain word (for instance, in the expression "it's ʔabsolutely true"), it is a regular consonant in the standard German system of sounds. Compare also the distinct nasal vowels in French with the Sandhi nasalization of vowels in English. In Dutch the [g] sound as in the English word *go* is merely a variety of [k], etc.[30]

Sound systems are important realities in the different lan-

guages.[31] It is possible and, for purposes of theoretical analysis, quite justifiable to isolate a sound and to place it for the time being outside of its relative connection with the other sounds of the language to which it belongs. In reality, however, speech sounds have no existence outside of a given system in a given language, and hence they are eminently of a psychological character, since the system itself is a psychological product of association and grouping. The psychological aspect of language is revealed not only in the word and its meaning, but in the very smallest linguistic element. It would be a gross error to believe that speech sounds are purely mechanical articulations or their acoustic results or mere combinations of these two. There is an essential difference between the sound that we produce when we blow out a candle and that which begins the English word *where*,[32] although physiologically and acoustically they may be pretty much the same.

Psychological Phonetics

We have mentioned the distances that are felt to exist in every language between its various distinct sounds. It is very suggestive that no two persons of the same language should pronounce individual sounds exactly alike and that nevertheless this diversity should not be realized by the average observer. The reason is that our attention is by no means drawn to slight divergences in the pronunciation of individual sounds, but to the perspective of each sound with the rest of the phonetic system. And this perspective is determined by the potential occurrence of each sound in meaningful combinations characteristic of the language in question. If in a language a post-dental [l] is used in certain words with certain meanings and a palatal [l] in other words

[31] *Cf.* pages 104*ff.* See also Sapir, "Sound-Patterns," *Language*, I, pp. 37–52; Meinhof, *op. cit.*, pp. 18*ff.*; Jespersen, *op. cit.*, pp. 104–18.
[32] *Cf.* Sapir, *loc. cit.*, p. 37.

with other meanings so that a confusion of the two [l]'s would entail a corresponding confusion of words and meanings, the distance between the two varieties of the liquid is essential. The substitution of one for the other is noticed and resisted immediately by any representative of the language community.[33] It will be noticed, however, not because of the absolute divergence, but on account of the resulting disruption of the mutual relationship of sounds in the system. The sounds of a language are not absolute but relative values; they are parts of a whole, which exists as such in the minds of the speaking community. This does not mean that the phonetic systems of the various languages should always remain unchanged. Disturbances occur continually in every language. As long as they are limited to the individual speaker, he will be taught somehow that his pronunciation is wrong, and it will have no effect upon the system in general. But if a particular sound in a language is gradually shifted in a certain direction by the community as a whole, that means that the system itself is in process of modification. Sometimes this will result in a loss, as was the case in Sanskrit when Indo-European *e* and *i* shifted in the direction of *a* and finally coincided with the latter without compensating for the loss of *e* and *i* by developing another vowel. In other instances the loss will be made up

[33] For instance, Welsh has both voiced and voiceless [l], [r], [m], [n], and [ŋ] with quite distinct values. On pages 56–57 of his *Language* Sapir says: "The *t* of *time* is noticeably distinct from that of *sting*, but the difference, to the consciousness of an English speaking person, is quite irrelevant. It has no 'value.' If we compare the *t*-sounds of Haida, the Indian language spoken in the Queen Charlotte Islands, we find that precisely the same difference of articulation has a real value. In such a word as *sting* (= 'two'), the *t* is pronounced precisely as in English, but in *sta* (= 'from') the *t* is clearly 'aspirated', like that of *time* . . . From its own [Haida] psychological standpoint, the *t* of *sting* is as different from that of *sta* as, from our standpoint, is the *t* of *time* from the *d* of *divine*. . . . The Haida ear finds the difference between the English *t* of *sting* and the *d* of *divine* as irrelevant as the naïve English ear finds that of the *t*-sounds of *sting* and *time*." See also Martin Heepe, *Lautzeichen*, p. 19, 9.

by the emergence of a new sound. When in Dutch Germanic [o·] became at first diphthongized to [oə] and later again monophthongized to [u], this [u] coincided with a sound which had been standard in the system of the language before. The result was not a loss, however, because the old [u] parted company with the young usurper and eventually became [y].[34] The distances that are felt to exist between the sounds of the various phonetic systems differ from one language to another, but the fact of a psychological coherence is common to the systems of all languages.

Other Psychological Features of Speech Sounds

The psychological aspect of speech sounds is patent from still another point of view. Not only has each language a characteristic set of phonemes of its own, not only does it space them in a definite manner as to their articulatory, acoustic, and semiological values, but each sound is psychologically defined by definite phonetic surroundings peculiar to the language. Physically and physiologically the [g] sound as in the English word *go* exists also in Dutch. But whereas in English it may be associated with many other sounds and with many positions, initial, medial, or final (compare *go, bigger, drug*), in Dutch it only occurs as a voiced variant of [k], namely, when [k] is followed by [b] or [d] (compare *zakdoek*). In Dutch, therefore, [g] is never initial, final, or intervocalic. Its psychological value is quite different from that of the English [g], although in terms of physiology and acoustics it is practically the same phoneme in both languages. Psychologically its existence in the Dutch language is rather problematic, because the Dutch people as a whole have no consciousness of its occurrence.[35] Simi-

[34] *Cf.* A. G. van Hamel, "Ons conservatieve klankstelsel," *Tijdschrift voor Nederlandsche taal- en letterkunde*, Vol. 47, p. 8.

[35] *Cf.* pages 38, 178. To the Dutchman the difference between [k] and [g] is no more a psychological reality than is the difference between the [k] of *kin* and that of *cool* to the Englishman.

larly, the German affricate [ts] as in the word *zehn* is known to the English language, as may be inferred from the English word *lots*. Yet psychologically it is essentially different in the two languages: in English it is interpreted as two phonemes whose combination never occurs initially, whereas in German it is associated with any position in the word and is felt to be one phoneme. That this difference is not a mere fiction, but is really felt by the representatives of the respective languages, is clearly evidenced by the fact that an Englishman often experiences difficulty in pronouncing [ts] at the beginning of a word like *zehn* and that a Dutchman needs special practice before he succeeds in the pronunciation of initial [g] as in the English word *go*. Naturally this has also its bearing upon the phonetic changes that take place in the various languages.[36] Furthermore, although it is true that sounds are purely phonetic entities, it should not be forgotten that all semanto-phonetic units consist of sounds which are not merely juxtaposed but which flow into each other in a very definite order. Speech curves show that it is impossible to isolate any sound, say [ɑ], from any word, say *father*, without at the same time changing the curve of that sound, which indicates that the sound itself has changed. The psychological unity of a word or of a connected group of words leaves its imprint of inalienable idiosyncrasy upon every one of its constituent phonemes.

Again, the share that sounds have in the semantic value and unity of the word becomes quite evident if we try to change their order of succession, as, for instance, in *tale* and *late*; or if we drop one phoneme leaving the others intact, as in *tale* and *ale*; or if we replace one sound by another, as in the following series: *bite, bit, bat, boot, but, bet, beat, boat*. It is clear, therefore, that speech sounds have to be looked at from several aspects, any of which may be examined more specific-

[36] *Cf.* Sapir, "Sound-Patterns," *loc cit.*

ally for purposes of analysis; but whatever our attitude may be, we must never ignore the fact that one side is at least as characteristic as the other. That this has not always been realized by phonetists is responsible for a controversy between what may be called the "acousticists" and the "geneticists."[37]

The Acousticist's Viewpoint

The acousticists claim that speech consists primarily of sounds to be heard, not of articulations to be produced or seen. Although to the casual observer sounds may appear as effects caused by articulations, in reality the relation between the two is exactly the reverse. For when we learn to speak, we are above all concerned with the reproduction of sounds as heard from other persons and as registered by our brain; the articulations required for such reproduction are only instrumental in achieving what is first in our minds and in our ears, namely, the sounds. The language that we inherit from the surroundings in which we are born is a language of sounds, not of gestures or of articulatory movements. A child will gradually correct its own pronunciation in proportion as its ears become more sensitive in discriminating between various acoustic shades. In this effort it is considerably assisted by the circumstance that the sensitiveness of the ear to fine distinctions of sound is much greater than that of many parts of the mouth or throat to particular contacts or shapes. Besides, physiologists are wrong when they assert that the mouth opening must decrease and the front or back tongue must rise toward the palate in order to pronounce the vowel series [a], [æ], [ɛ], [e], [i], or [ɑ], [ɔ], [o], [u]; that the lips must be rounded in order to produce a good [u] or [o], [y] or [ø]. As a matter of fact, the latter sounds can be pronounced with neutral or even spread lips; if we

[37] *Cf.* page 8; also Jespersen, *op. cit.*, pp. 65–104; Stumpf, *Die Sprachlaute*, pp. 1*ff.*

care to, we can pronounce [a] with a greater mouth closure than [e]; the tongue may rise just as high or even higher for the pronunciation of [e] than for that of [i]; [æ] often shows a more considerable arching of the tongue than [e], and so on. It is an unquestionable fact that the same sound can be and actually is produced by a great variety of different articulations. This might be inferred *a priori* from the fact that no two persons have identically the same organs of speech; it is unequivocally shown by palatograms as well as by X-ray pictures of the articulating parts. Why, then, should a reproduction of articulatory movements result in producing the same sounds? For all these reasons the acousticists say that no classification or description of speech sounds based upon physiological movements can have any scientific value. The only scientific way of defining sounds is that which rests upon analysis of their acoustic qualities. This can be done by various methods which enable us to establish the absolute and relative number and the amplitude of fundamental and partial vibrations corresponding to each sound. As far as nomenclature in general is concerned, terms like "metallic," "bright," "soft," "indefinite," "dark," "mellow," etc., should take the place of "open," "closed," "high," "low," "front," "back," etc.

The Geneticist's Viewpoint

On the other hand, the geneticists believe that articulation is more essential than sound, or that at least they are equivalent and interchangeable values. In regard to psychological priority, it is a very controversial question whether the sound is primary and the articulation only secondary or vice versa. It is quite true that in the transmission of language from generation to generation acoustic perception guides the articulations of the speakers. But such guidance may have been of little importance at the time when speech was first invented by man; Wundt has made it at least plausible that the origin

of language is to be traced to the imitation of movements or gestures of which sounds were only secondary results. It seems perfectly puerile to fight about the priority of the egg or the chicken. Whatever may be the truth in this matter, it cannot be denied that even in later stages of language-making individual creation and initiative are constantly at work. Furthermore, it is impossible to speak without articulating, whereas articulation without sounds may be quite understandable. Everybody knows how skillful deaf-mutes become in the art of lip-reading. It is also pointed out that in the speech of normal people elements like the voiceless stops cannot be heard. When we pronounce [p], [t], or [k], there is neither voice nor noise for the whole duration of the stop between implosion and explosion. Similarly, the [h] sound may be pure breath without any accompanying friction. Obviously, such speech elements cannot be said to possess any acoustic qualities. As far as the sensitiveness of the ear is concerned, every modern-language teacher knows how great its limitations are. It is just as possible to train our sense of touch with respect to articulations as to educate our ears in the differentiation of acoustic tones. In spite of possible divergences in the articulation of what is deemed to be the same sound, the geneticist does not admit that articulation and sound are not two terms of an equation. But he does insist upon the necessity of taking into account all the parts of the speech organ, as it is quite possible that each of them separately is subject to variations which may then be compensated for and neutralized elsewhere. In any case, it is believed that the description of the various sounds as given by the outstanding representatives of the physiological method corresponds on the whole to the actual articulation of those sounds by the average person. Naturally, such a description is typical rather than exclusive, and each phoneme exists empirically in the form of several varieties, the exact characteristics of which depend on anatomical

and psychological conditions of the speaking individual as well as on the phonetic surroundings of the sound concerned. Moreover, some geneticists demand that in the description of any sound articulation only such factors be chosen as are constant and essential, while accidental and changeable ones should be carefully eliminated.[38] If the greatest stress is laid upon the various tongue positions and upon the shapes of the front part of the mouth, the importance of the other articulating parts, such as the pharynx, the epiglottis, and the larynx, is not denied. Nor are acoustic principles entirely ignored by the traditional classifier, as may readily be seen from the distinction between voiced and voiceless sounds. And finally, the genetic classification can boast of having created a large and discriminating terminology of undoubted practical value. The acousticist is at a loss when it is a question of describing in popular terms such a variety of voiced sounds as [ɑ], [æ], [ɛ], [e], [i], [o], [ɔ], [u], [y], [ɸ], [œ], [m], [n], [ŋ], [l], all of which may be uttered without any audible friction or noise.

In our own treatment of the subject we have endeavored to do justice to all the aspects of the speech sound. If in our classification the traditional method has been given the preference, our justification is not only that we have no acoustic substitutes for many physiological terms, but also that without understanding the traditional nomenclature it is impossible to approach the linguistic and philological literature. Although acoustic associations and analogies may be responsible for many more phonetic changes than is generally realized, most of these changes are undoubtedly explained by linguists on the basis of articulatory influences and described by means of the corresponding terminology. Terms like "high," "low," "open," "closed," "front," "back," "palatal," "velar," "palatalization," and so on

[38] See, for example, J. E. Forchhammer, *Die Grundlage der Phonetik.*

have found such a universal recognition that it seems hardly possible ever to get rid of them. The best that could be expected to happen would be that eventually their meanings might change.

General Properties of Sounds

Aside from such characteristics as voice, breath, friction, explosion, etc., all of which are restricted to special classes of sounds to the exclusion of others, there are certain general properties common to all or most phonemes. The most outstanding are pitch, acoustic coloring, timbre, stress, and duration.

Pitch

Physically speaking, pitch depends directly upon the frequency of the vibrations that engender the sound. The more vibrations in a given unit of time, the higher the pitch; the fewer vibrations, the lower the pitch. In compound tones resulting from the combination of fundamental and partials, each with a certain pitch of its own, it is the fundamental that gives the acoustic impression of general pitch to the whole. The pitch of the fundamental and, consequently, of the compound tone can be made to vary by stretching or relaxing the vocal cords through various articulatory movements of the larynx or by increasing the subglottal air pressure. The tenser the cords, the more frequent the vibrations produced in the same unit of time with the same intensity of expiration. Furthermore, other things being equal, long strings vibrate less frequently than short ones; hence, the voice of persons with relatively short vocal cords (children and women) is higher pitched than that of speakers with a larger larynx.

Because of the presence of glottal vibrations and the resulting variability of pitch in the fundamental, each individual vowel can be sung in spite of its being characterized by certain

partials of a specific pitch. The same holds true for voiced consonants, although certain limitations are caused here by the narrowing or closing movements of the upper speech organs which, in turn, affect and limit the resonance capacity and the control over the vocal cords. In the breathed vowels, on the contrary, there being no changing fundamental tone, pitch practically coincides with vowel quality and is, on the whole, constant. They cannot be sung. As to voiceless consonants, they too possess a certain pitch, the degree of which is not easily distinguished but none the less ascertainable. Although certain variations of a limited character are possible with such sounds as [ʃ], [s], [k], and others, they cannot be sung for the same reason as the breathed vowels.[39]

Acoustic Coloring

In vowels the property of acoustic coloring is nothing but their specific vowel quality, that is, that which differentiates, for instance, the [o] sound from the [u] sound. We have seen that voiced vowels consist physically of compound vibrations produced by periodically repeated puffs of the air being pressed through the glottis. Analysis of their composition shows the existence of one set of fundamental vibrations with a superimposition of a varying number of sets of subordinate ones. The specific vowel quality is effected by the intensity, the pitch, the number, and the reciprocal relationships of the overtones brought out by the resonance chambers above the larynx. According to some theories, these overtones are actually present in the compound tone produced by the glottal vibrations and are merely reinforced in the superlaryngeal resonators in agreement with the vowels to be produced. Others maintain that they are developed in the resonance chambers independently of the compo-

[39] *Cf.* Stumpf, *Die Sprachlaute*, pp. 143, 157.

sition of the compound glottal tone but that they correspond to vibrations of the air striking certain parts of the specifically shaped resonators themselves. In the production of breathed vowels the particular vowel effect is certainly brought about by superlaryngeal vibrations only, since the vocal cords are not supposed to vibrate at all. Voiceless consonants, of course, have very little acoustic coloring, both because of the poor resonating conditions and because of the absence of glottal vibrations. However, they are not entirely without this particular property, as may be inferred from the fact that they have a certain specific pitch. For instance, the palatal [ç] sound, as in the German word *ich*, has a marked [i] coloring; velar [χ], English [w], the nasals [m], [n], [ŋ], have a decided [u] coloring, etc. The shade of [s] can be made to change considerably by stretching or protruding the lips. The vowel coloring of voiced consonants depends chiefly upon the possibility of combining their own articulation with various resonating shapes of the upper speech cavities. Thus, [l] can be pronounced with a very good [ɑ], [u], or [o] coloring. In this respect they are more or less extensively affected by the preceding or following vowels in connected speech.

Timbre

Timbre is the property that differentiates two sounds of the same pitch produced by two different instruments, for instance, by a violin and a piano, or even by two different violins or two different pianos. In speech the [ɑ] sound pronounced by Henry is easily recognizable as peculiar to him and as different from anybody else's, even though they are uttered with the same pitch. When comparing voices we often characterize them as thin or full, as soft or metallic, as sharp, rough, or sweet. All these individual varieties of voice timbre are due to various causes, but the main and immediate cause is always the structure of the sound itself.

For although every vowel is the result of the combination of certain characteristic partials, there is room for changes in their relative intensity or for the existence or absence of weak overtones which do not affect the essential tone quality of the sound as such but modify its timbre. One of the factors that contribute to the production of such individual divergences is the fact that no two organs of speech are exactly alike. We have seen also that the same sound can be obtained from different articulations, the total results of which may very well present slight peculiarities without involving any essential differences. Then, too, there is the influence of soft and hard walls of the resonating cavities, besides that of the average force of the voice, which varies from individual to individual and which produces certain peculiarities in the relationship of intensities of the component partials and therefore modifies in a way the sound as a whole. Moreover, the register of each individual seems to be responsible for special timbre effects. Of this there is no doubt if we define register as "the range of the voice within which it produces tones of the same general acoustical quality."[40] The so-called head or falsetto register is known to be generally poorer in overtones than the chest register. But even if register is understood to mean the general compass of a voice, it seems to have its influence upon the timbre. There is a noticeable difference between the same vowel of the same pitch sung by a bass and by a tenor voice. Finally, differences in timbre may be simply a psychological illusion on the part of the hearing subject. As a result of psychological associations real divergences of vowel quality, as, for instance, that which exists between the more metallic palatal [a] and the darker velar [ɑ], may be subjectively attributed to timbre rather than to irregularities in the structure and articulation of the vowel.

[40] E. W. Scripture, *Elements of Experimental Phonetics*, p. 272.

Stress

Stress also is a property common to all sounds. It may change while pitch and duration remain the same. From a purely physical point of view the stress of a sound corresponds to its intensity; hence the name of *intensity accent* which is frequently given to its distribution over connected speech sounds. It is directly proportional to the square of the amplitude of the vibrations. As to the acoustical effect, physical stress often results in greater loudness and distinctness. But, strangely enough, although these qualities increase with the physical intensity, they do not augment in the same proportion. Experiments have shown that in the case of vowels, for instance, the increase in loudness and distinctness is somewhat less than that in amplitude, and consequently it is considerably less than the increase in intensity, which represents the square of the amplitude. To put it more simply, the auditory impression of distinctness of a sound grows with its actual intensity, but to a considerably less extent.[41] As to the reciprocal relationship between the physical intensities of the component partials, this varies from sound to sound. Besides, the subjective perception of the stress may be influenced by the motor energy displayed by the speaker: even when listening we follow and accompany the articulations made by the interlocutor.[42] Thus it happens that even a whispered vowel may carry the main stress of a word.[43]

From a motor point of view, greater amplitudes are conditioned by a corresponding increase in articulatory tension or muscular activity of all the parts concerned. In voiced sounds the vocal cords are more tensely closed and the subglottal breath pressure is increased; in voiceless sounds the

[41] *Cf.* Stumpf, *Die Sprachlaute*, p. 17.
[42] *Cf.* page 178.
[43] *Cf.* page 22.

superlaryngeal articulations are more distinctly and energetically produced and the pressure of the air stream above the larynx is greater. It has been said that stress grows with the volume of air used in the production of the sound. The German term, *expiratorischer Akzent*, is based upon this view. If we take into consideration only the amount of subglottal air, this may be true; but if we consider the volume of air that actually escapes through the larynx, it is evident that in the pronunciation of a stressed vowel less air escapes than in that of an unstressed one, whereas the reverse is true in the formation of voiceless consonants or breathed vowels. The greater stress of voiced sounds is obtained by a tenser closure of the vocal cords, so that the increased amplitudes are not the result of the use of more air but of more subglottal air pressure; in stressing voiceless sounds the vocal cords are wide open and a large amount of air passes through. If pressure remains constant, the laxer the constriction, the greater the escape of air. Pitch and stress are two essentially different properties which are not necessarily interdependent. We can sing a tone of the same pitch with changing stress and one of the same stress with varying pitch. To this end continual adjustments of the vocal cords, air pressure, and laryngeal muscles are required. These constant readjustments are not easy to perform, and the result is that in actual fact a rise in pitch is often accompanied by an increase of stress and vice versa.[44]

Duration

Duration is also called *quantity*. The absolute duration of a sound is, of course, the period of time used for its production. It can be exactly measured by various mechanical methods.[45] Terms like "long," "half-long," "short," etc.,

[44] *Cf.* Scripture, *op. cit.*, p. 513.

[45] See the speech curve on page 60 and the accompanying duration charts, Figures 11A and B.

express a mere relation. A sound which is long with reference to another may be short in relation to a third; what is considered as long in one language may be short in another because of the difference in general tempo characteristic of each. It goes without saying that the quantity of a sound is quite distinct from its pitch, stress, or acoustic coloring. But here more than elsewhere mental illusions play an important part. Vowels which are generally believed long are often short; others which are regarded as short often surpass in length those which are deemed long. Again and again graphic methods show that sounds supposed to be long are in reality only more stressed or higher pitched. In the combination "Vater und Mutter" the so-called long [a] in *Vater* is occasionally found to be pronounced shorter than the unstressed [ə] of the following syllable.[46] The distinction between what are termed short [ɛ] and long [e] in German is a distinction not only of duration but also of vowel quality. They are two sounds of utterly different structure and acoustic value. Although the former happens to be generally short in German, there is no objection to its being long in other languages. Very often the terms "long" and "short" refer to subjective or mental impressions rather than to physical properties. The sound that by some peculiar feature impresses the ear more than others is easily felt to be longer even though it actually is not.

The Syllable

The Need for a Theory of the Syllable

We have mentioned that the first phonetic writing system resorted to by man was syllabic.[47] The syllable, then, must have been felt as a reality even before the speech sound had been discovered. That the syllable is not a mere fiction or

[46] *Cf.* Scripture, *op. cit.*, p. 489.
[47] *Cf.* page 5.

an invention of philologists and grammarians is further evidenced by the general consciousness that speaking people have of its existence. Even persons without any culture at all are able to tell without hesitation how many syllables there are in almost any word of their vocabulary. Many popular songs, products of naïve poetry, are based upon a distinct intuition of the number of syllables. Cases of aphasia are known in which the patient has lost all remembrance of sounds but has kept a very clear feeling of the articulatory movements corresponding to the syllables: when he tries to speak, he makes as many efforts of expiration as there are syllables in the word or words he wants to utter. The syllable is one of those things of which we all have an intuitive knowledge but which it is extremely difficult to define with a satisfactory degree of adequacy. This is the more regrettable because many linguistic phenomena are due to syllabic conditions and cannot be explained except upon the basis of some theory of the syllable.[48]

The Stress Theory

For a long time the syllable was supposed to correspond to a single stream of breath. There were as many syllables in a word or text as there were separate breath puffs. The top or crest of every syllable corresponded to the maximum of force of such a breath wave, and the syllabic limit to the point of lowest depression between two such waves. But because of the gradual transition with which we pass from one syllable to another, it was admitted that the exact demarcation between syllables was very often not ascertainable.

This concept of the syllable was based exclusively upon the subjective impression of the hearer or speaker. It was not even abandoned when this impression was found to conflict

[48] *Cf.* Eduard Hermann, *Silbenbildung*; Pierre Fouché, *Etudes de phonétique générale.*

with intuition, though it was soon pointed out that words which were intuitively felt to contain two or more syllables (for instance, Germ. *Eier, fasse, Kammer*)[49] could be easily pronounced with a single impact of breath. But no better explanation seemed to be at hand. Later on, when the process of breathing could be exactly measured and experimentally registered, it was definitely established that as far as respiration was concerned, such syllabic waves were present only if one intentionally scanned the syllables, but that no break of continuity whatsoever in the flow of air was to be noticed if one spoke just naturally. The difficulties arising from this demonstration were acknowledged in due time, so that today the breath syllable is hardly adhered to any more, though it still lingers in traditional grammars and dictionaries, old and new, which do not keep abreast of the advances made by the science of speech sounds. In a more specific form, however, a sort of stress syllable is still conceded to exist by modern phonetists in order to account for certain difficulties connected with other theories of the syllable.

The Sonority Theory

The definition most commonly accepted nowadays is based primarily upon the relative sonority of sounds and only secondarily upon the force of expiration.[50] The degree of sonority of a sound is measured by the distance at which it can be heard and distinguished. It depends upon many circumstances. In the first place, every sound has a natural sonority according to its acoustic characteristics. Because of better resonating conditions vowels are more sonorous than consonants, and among the vowels the open ones are superior to the closed ones. Next come the voiced liquids and nasals,

[49] *Cf.* G. E. Sievers, *Grundzüge der Phonetik*, pp. 184–97; Wilhelm Vietor, *Elemente der Phonetik*, pp. 305*ff.*

[50] *Cf.* Jespersen, *Lehrbuch der Phonetik*, pp. 190*ff.*

succeeded by the voiced fricatives and explosives, and finally the least sonorous of all are the voiceless fricatives and explosives. Neglecting all minor or intermediate sounds, the order of decreasing sonority may, therefore, be represented by the following series: [a], [e], [o], [i], [u], [r], [l], [m], [n], [v], [z], [ǥ], [j], [ʒ], [b], [d], [g], [f], [s], [x], [ʃ], [p], [t], [k]. In addition, the sonority may be influenced by such factors as expiratory force, pitch, quantity, and energy of articulation. The same sound will be the more sonorous the more energetically it is stressed, the higher it is pitched, the longer it is, and the more strongly it is articulated.

Applying this to the point under consideration, we shall have as many syllables in a word or in a text as there are summits of sonority heard. Let us take the word *drinkable* (phonetically [drɪŋkəbl̩]) as an illustration. The [ɪ] sound is placed between [r] and [ŋ], both of less sonority; [d] is still less sonorous than [r], and [k] is less sonorous than [ə]; then comes [ə], the sonority of which is superior to that of [b]; [b] is followed by the more sonorous [l] sound. If we represent graphically the ups and downs of sonority as present in this particular word, we obtain a curve or a zigzag line rising from [d] to [ɪ], falling from [ɪ] to [k], rising again from [k] to [ə], falling again from [ə] to [b], rising again from [b] to [l] (Fig. 8). In other words, we have three summits or crests of sonority, one represented by the vowel [ɪ], one by the vowel [ə], and one by the liquid [l]. Their degree of sonority is not the same, but they are separated from each other by a continuous drop followed by a continuous rise. Consequently the word *drinkable* has three syllables.

The sound that possesses the highest degree of sonority in a syllable is called *syllabic* or *sonant*, the others are *unsyllabic* or *con-sonant* (in the narrow sense of the word). Certain sounds, especially liquids and nasals but also spirants, may

be used either in a syllabic (sonant) or in an unsyllabic (consonant)[51] function. In the word *ably* [l] is unsyllabic; in *able* it is syllabic. Here is an entire Czech sentence in which all the sonants are represented by the liquid [r]: "strč prst skrz krk" (= 'push the finger through the throat'). Also varieties of vowels, such as [i], [u], [y], [ə], and others, may act as con-sonant or unsyllabic sounds, as will be seen from the definition of diphthongs given below. As has been

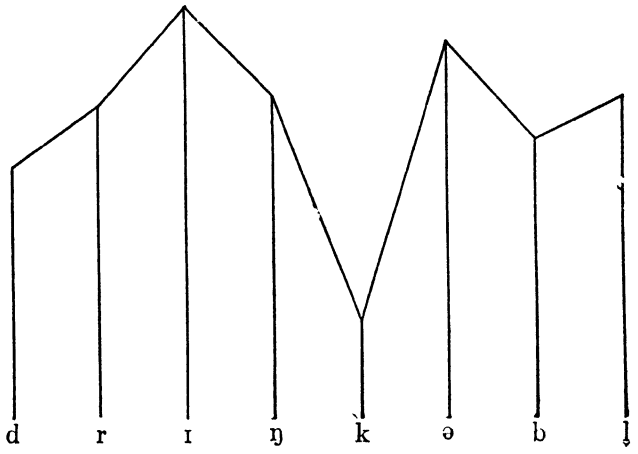

FIG. 8

stated previously, it happens that a negligent articulation develops an audible glide between two unsyllabic sounds. The German word *Volk* is often dialectally pronounced with an indefinite [ə] sound between [l] and [k]. In that case, of course, the glide forms a new summit of sonority which results in an additional syllable. As far as the point of demarcation between two syllables is concerned, it cannot be ascertained more exactly than the point of a valley which separates two mountains. In the word *coming*, for instance,

[51] *Cf.* page 21.

the nasal [m] belongs to both syllables; the limit between the two lies somewhere within the pronunciation of [m].

This theory, too, has its weak spots. In the first place, the relative sonority of sounds is something very subjective. There exists no experimental method by which to measure it objectively. The experiments that have been made to establish the distance at which a sound can be heard and distinguished are entirely dependent upon the subjective condition of the experimenter's ear, upon the doubtful possibility of uttering various sounds with exactly the same intensity, and upon the gratuitous assumption that the medium and conditions of transmission remain unchanged during the time of the test. Furthermore, whereas the number of breath syllables of a given sound combination is often smaller than that intuitively heard (compare Germ. *Eier*), the application of the principle of sonority often results in a number of syllables greater than that which would normally be expected. If we examine the word *states* (phonetically [steɪts]), we find that its theoretical sonority curve would have three summits (Fig. 9), and that, therefore, it would be trisyllabic, which is manifestly against our common feeling. In the word *pst* we normally recognize the syllabic character of [s], whereas in regard to the German word *Obst* (phonetically [o·pst]), our common sense disagrees with the theory, according to which it would be disyllabic. Yet from the point of view of mere sonority the combination *pst* is, to all intents and purposes, the same in both instances. This difficulty is explained by the statement that the difference in sonority between voiceless fricatives and voiceless explosives is very small. In a monosyllabic word like *pst* [s] is felt as syllabic because of the aloofness of the syllable. In Germ. *Obst*, on the contrary, the phonetic combination *pst* does not impress us as a syllable because the slight increase in sonority from [p] to [s] is negligible compared with the overwhelming sonority of the preceding stressed vowel.

Another difficulty is created by diphthongs of the type of Middle High German *úo* and *ía*, as in *múoter* and *líab*, which are still alive in modern dialects of South Germany. Although [u] is theoretically less sonorous than [o], the syllabic crest is intuitively felt to lie upon [u]. Again, how is it to be explained that where the same vowel occurs twice in immediate succession, we naturally count two syllables, although

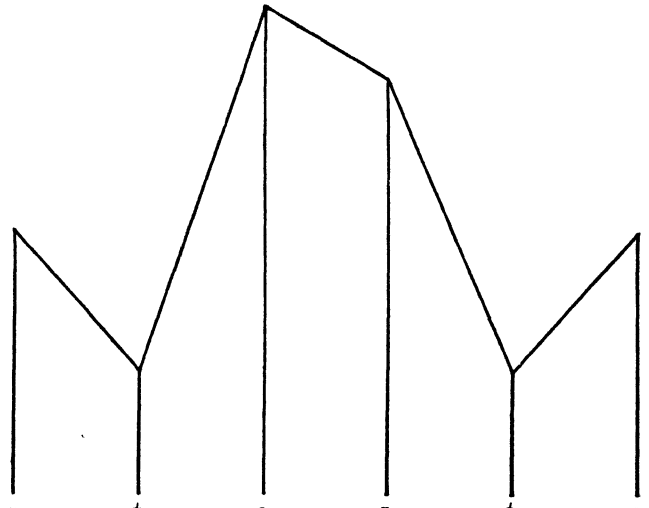

FIG. 9

the crests of sonority of the two adjacent vowels are not separated by sounds of less sonority? In the French sentence "Il a à travailler," for instance, there is no unsyllabic sound between the second and third word, and consequently, judging from the natural sonority of the phonemes, there are no more than five summits in the entire sentence. Yet we know that it possesses six syllables. In accounting for these facts the force of expiration is resorted to as a secondary principle of sonority. In the case of the diphthongs *úo*

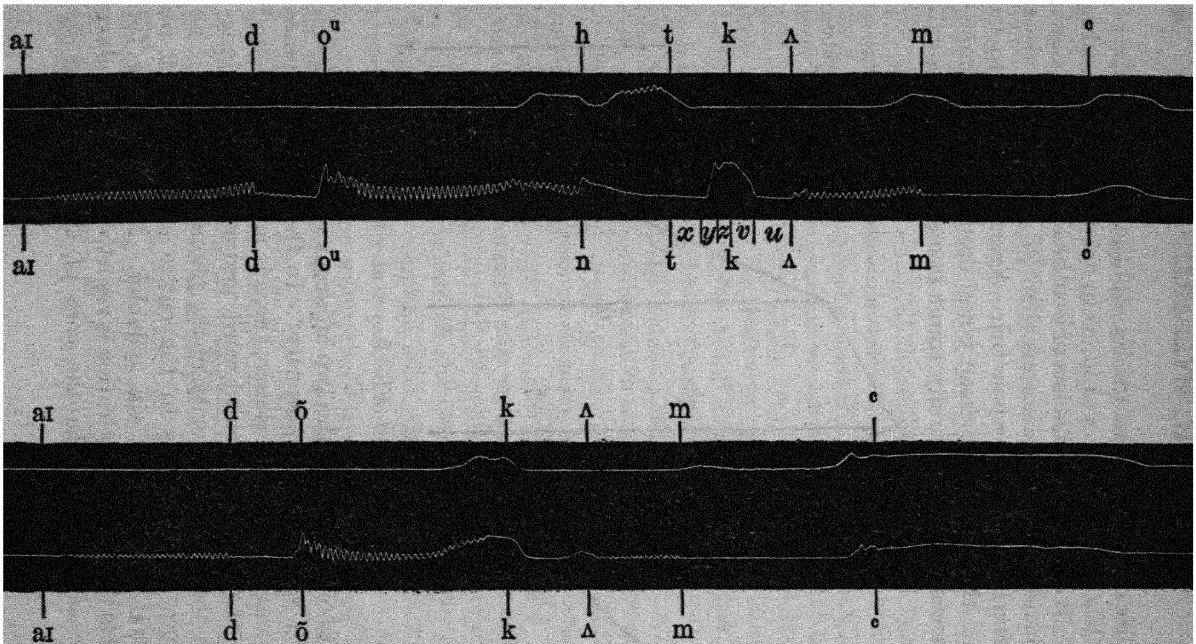

FIG. 10. ANALYSIS OF SPEECH CURVES AS TO BREATH, VOICE, NASALIZATION, ASSIMILATION, AND DURATION

See the following pages for detailed interpretation of the curves.

Analysis of Speech Curves Shown in Figure 10

These curves were obtained with the recording outfit of Prof. E. W. Scripture in the Phonetic Laboratory of the West End Hospital, London, England, Aug. 18, 1930. The speaker was a young Irishman who had lived in London for several years. The curves are two-thirds natural size, and the time line in both sets is almost exactly 100 mm. = 1.00 sec. In curves of this kind the upward deviation from the horizontal neutral or zero line signifies outstreaming air. If these deviations are without vibrations, they represent breath (open glottis); if they are accompanied by vibrations, we have voice filled with air (the vocal cords are sufficiently tight to vibrate but not tight enough to cut off the stream of air, or else a certain amount of air escapes through the opening left between the bases of the arytenoid cartilages). Where the curve follows exactly the zero line, we have either no outstreaming air at all, as in the case of an obstruction above the vocal cords (implosion) (Curve IB, *x*), or the vibrating vocal cords are so tight that they allow hardly any air to escape (for example, for practically the whole duration of [aɪ] in Curve IIB). A sudden rise of the curve indicates explosion, as can be seen very clearly at the end of [d] and [t] in Curve IB.

Curves IA and IB are a graphic representation of the phrase "I don't come" [aɪdoᵘntkʌm], in which the [nt] of *don't* is pronounced. Curves IIA and IIB reproduce the same phrase but pronounced in a more careless manner, with the omission of the [nt] of *don't*, as it is often heard in popular conversation: [aɪdõkʌm]. In both reproductions the upper curve (A) represents the nasal stream of speech, the lower curve (B) the buccal stream. The main reason for the choice of the two phrases was to illustrate the effect of the omission of the [nt] in *don't* upon the surrounding sounds, especially in regard to nasalization. It will be noticed that in the first set of curves the nasalization begins during the pronunciation of [oᵘ], but that it becomes very noticeable only with the uttering of [n]. In the second set, on the contrary, we find nasal vibrations of a considerable strength over a marked distance before [k]. In other words, the latter part of [õ] is distinctly nasalized. We have here a good illustration of the origin of French nasal vowels, which, as is known, were formerly pure buccal sounds followed by a nasal consonant.

In both buccal curves the initial [aɪ] sets in gradually, with slowly but steadily increasing strength; there is neither glottal catch nor aspiration. In the nasal lines we notice several stretches of vibrations although they do not correspond to any genuine nasal sound; this is due either to a little twang of the speaker, to assimilation with the neighboring nasal consonants, or to a communication of the vibrations to the nasal air through the bony and fleshy parts of palate and velum. Between the [n] and the [ʌ] in Curve IB we find in the first place the implosion of the [t] (at *x*); then its explosion (at *y*); then there follows a vowel glide of very short duration (at *z*), after which the curve falls down to the zero line (at *v*) for the implosion of [k] (at *u*); and finally the explosion of [k] is very slight and almost entirely neutralized by the sudden beginning of [ʌ]. In Curve IIB the explosion of [k] is somewhat more pronounced, and besides the [ʌ] is a little aspirated at the

and *ta* the greater sonority of [u] and [i] is attributed to considerably greater stress. As for the repetition in immediate succession of the same sound, a valley of sonority is established between the two by a decrease in stress at the end of the first and a renewed increase at the beginning of the second.

The Theory of Buccal Opening and Closing Procedures

A third syllabic theory, propounded by Ferdinand de Saussure, is founded upon the number of successive opening and closing procedures of the mouth.[52] By this de Saussure does not mean the absolute apertures and closures characteristic of the various sounds taken individually, but the progressing increase and decrease of buccal opening in a spoken chain of sounds as the speaker passes from one sound combination to another. A syllabic opening or closure may be represented by one phoneme or else by several successive phonemes provided they follow each other in a certain order.

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beginning. Furthermore, in Curve IIB the [õ] sound ends in very slight vibrations at a high breath level, immediately before the curve falls to the zero line for the implosion of [k], while at the same time Curve IIA shows distinct nasal vibrations. It is probable that the speaker uttered a sort of [ŋ] as a glide between [õ] and [k]. The process of assimilation is beautifully illustrated in Curve IA, where the nasalization of [n] is anticipated long before the end of [oᵘ]. At the end of both phrases, after the implosion of [m] and before the curve returns to the zero line, we notice an explosion which consists mainly of breath, but in Curve IB also of distinct vibrations representing a final vowel glide: [ᵉ].

By converting space measurements into time measurements by means of the time line we obtain the following data as to the duration of each sound:

Curves IA and IB:	[aɪ] = 0.308 sec., [d] = 0.094 sec., [oᵘ] = 0.348 sec., [n] = 0.120 sec., [t] = 0.113 sec., [k] = 0.080 sec., [ʌ] = 0.174 sec., [m] = 0.241 sec., [ᵉ] = 0.074 sec.
Curves IIA and IIB:	[aɪ] = 0.241 sec., [d] = 0.087 sec., [õ] = 0.300 sec., [k] = 0.087 sec., [ʌ] = 0.121 sec., [m] = 0.275 sec., [ᵉ] = 0.322 sec.

These durations are graphically represented in the two duration charts, Figures 11A and B.

[52] *Cf.* de Saussure, *op. cit.*, pp. 77*ff.*

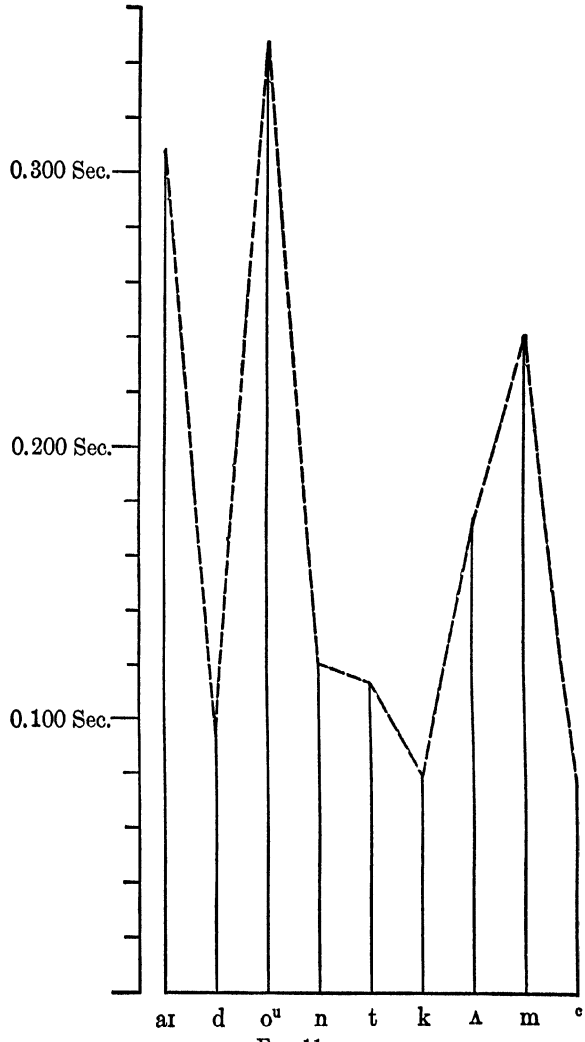

FIG. 11A

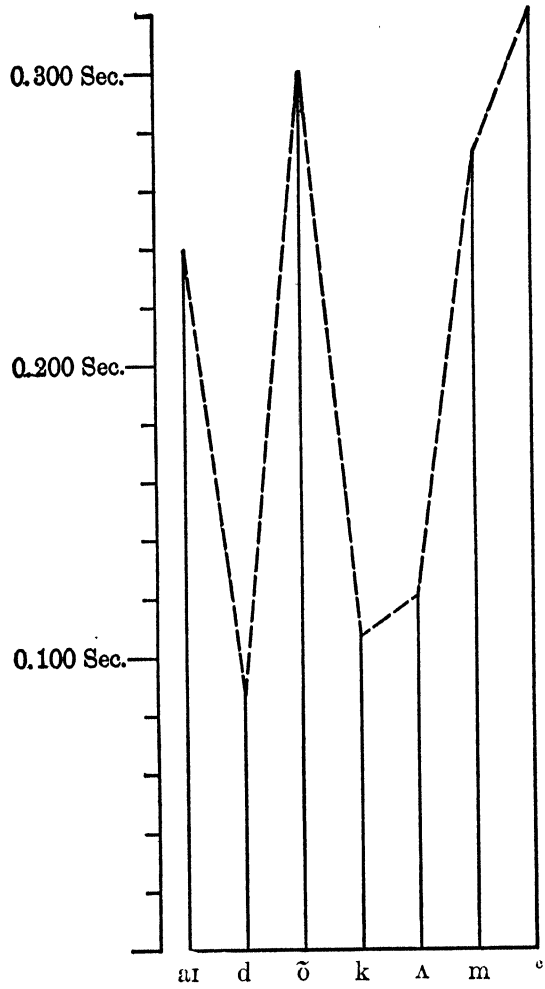

FIG. 11B

One and the same phoneme may be used now in an opening, then in a closing, combination. De Saussure divides the speech sounds into six classes according to their degree of

absolute mouth aperture. Aperture 0 is characteristic of occlusives; aperture 1, of fricatives; aperture 2, of nasals; aperture 3, of liquids; aperture 4, of [i], [u], [y] (both semi-vowels and vowels); aperture 5, of [e], [o], [ϕ] (both the closed and the open varieties); aperture 6, of [a]. In the word *tablecloth* (phonetically [teɪbl̩klɔθ]) we find the following series of absolute aperture: 0–[t], 5–[e], 4–[j], 0–[b], 3–[l], 0–[k], 3–[l], 5–[ɔ], 2–[θ], which correspond to three opening and three closing procedures or to three syllables. The first progressive opening begins with [t] and ends in [e]; the first closing begins with [e], passes through [ɪ], and ends in [b]; the second opening sets in with [b] and ends in [l]; the second closing starts with [l] and ends in [k]; the third opening begins with [k], passes through [l], and ends in [ɔ]; the third closing sets in with [ɔ] and ends in [θ]. The fact that a sound is part of a syllabic opening may be indicated by the sign < above its symbol; its being part of a syllabic closing may be represented by the sign >. This will give the following transcription of the above word: $\left[\begin{smallmatrix} < & > & > & < & > & < & < & > & > \\ t & e & ɪ & b & l̩ & k & l & ɔ & θ \end{smallmatrix}\right]$. The first closing phoneme after an opening one is the *sonant* or *syllabic sound*. If the word begins with a closing sound, this will be a sonant although it is not preceded by anything. The sonants represent the summits of aperture. In the given instance they are [e], [l], [ɔ]. The other sounds are con-sonants or unsyllabic. As may readily be seen in our example, [l] is sonant in the second syllable, con-sonant in the third. The demarcation beween two syllables occurs where a closing sound is followed by an opening one; the number of syllables is the same as that of progressive closings.

The objections to this theory practically coincide with those we have mentioned in connection with the preceding one. The word *states* (phonetically [steɪts]) would give $\left[\begin{smallmatrix} > & < & > & > & < & > \\ s & t & e & ɪ & t & s \end{smallmatrix}\right]$, which means that there would be three sonants,

namely the first [s], then [e], and the final [s]; consequently the word would be trisyllabic. In the expression "Il a à travailler" $\left(\left[\begin{smallmatrix} > & < & > & > & < & < & > & < & > \\ i & l & a & a & t & r & a & v & a & j & e \end{smallmatrix}\right]\right)$ we have only five sonants, and yet there are six syllables.

The Syllable as an Artificial Construction

Experimental phonetists are inclined to believe that the syllable is a mere fiction which can be given reality artificially but which has no objective existence in natural speech.[53] If, nevertheless, the concept of the syllable is to be salvaged, the only criterion as to their number in a word or word group is said to be the number of vowels. The assignment of syllabic limits can be done only according to absolutely arbitrary rules.

The Syllable as a Metrical Phenomenon

Others believe with E. A. Meyer that the question to be answered is not into how many syllables a word actually falls, but into how many it can fall.[54] In other words, it is a question not of actual division, but of eventual divisibility, which is not governed by arbitrary rules but by the laws of speech rhythm; the syllable corresponds to a rhythmical unit of speech. A similar explanation, though supported by different arguments, has been more recently advanced by A. W. de Groot.[55] Considered from the point of view of these advocates, the problem of the syllable is a metrical rather than a general phonetic one.

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[53] *Cf.* Giulio Panconcelli-Calzia, *Die Experimentelle Phonetik in ihrer Anwendung auf die Sprachwissenschaft*, p. 23; Scripture, "Die Silbigkeit der Silbe," *Archiv für das Studium der neueren Sprachen und Literaturen*, Vol. 152 (1927), pp. 74–75; Scripture, *Anwendung der Graphischen Methode auf Sprache und Gesang*, pp. 43–44.

[54] *Cf.* E. A. Meyer, "Die Silbe," *Die neueren Sprachen*, Bd. VI (1898), Heft 1, pp. 1–37.

[55] *Cf.* A. W. de Groot, "La Syllabe: Essai de synthèse," *Bulletin de la Société de Linguistique de Paris*, Vol. XXVII (1926), pp. 1–42.

The Syllable as a Physiological Phenomenon

Maurice Grammont claims that the essence of the syllable is to be found neither in the relative degree of stress nor in that of sonority, but in the muscular tension of the larynx.[56] From experimental measurements he concludes that a consonant that opens what we call a syllable involves an increasing laryngeal tension and that a consonant that closes a syllable is characterized by a decreasing tension. In the production of vowels the tension is always decreasing. Consequently the syllable may be said to consist of one or more phonemes of increasing tension followed by one or more sounds of decreasing tension. The syllabic limit, at least in certain consonantal groups, is very unstable, even with one and the same individual, but is exactly ascertainable: it corresponds to the lowest point in the curve of laryngeal tension. In the meaningless sound combination *umpu*, for example, it is shown that the lowest point of the tension curve is sometimes situated at the end of [m], sometimes during its pronunciation, and sometimes at the beginning of it. It is claimed that this explanation solves the difficulties that are insufficiently accounted for by the others. A word like *states* shows the same continuous increase followed by the same continuous decrease of tension as any other monosyllabic word, in spite of the apparently unnatural condition of sonority or of opening and closing procedures.

Loose and Close Contact of Vowels and Consonants

Although no causal relationship can be said to exist between the limit of syllables and the particular manner in which vowels and consonants are welded together in connected speech, there are certain coincidences between these

[56] This theory is explained and adopted by Fouché in his *Etudes de phonétique générale.*

two phenomena. Sometimes a consonant suddenly cuts off an immediately preceding vowel at a moment when the pronunciation of the latter is still very energetic; this happens, for example, in the English words *come, hit,* etc., and vowel and consonant are said to be in *close contact.* In other instances the consonant follows only after the pronunciation of the vowel has undergone an appreciable decrease of energy, as in the English words *path, father;* we then have *loose contact* between them. When a consonant in loose contact occurs in intervocalic position, it generally introduces a new syllable: the syllabic limit is felt to lie before the consonant. Thus, in the word *father* the second syllable begins with the dental fricative; in the word *path,* however, where the consonant in loose contact is final, it belongs to the same syllable as the preceding vowel. If the consonant is in close contact, as in the word *better,* the identification of the syllabic limit on the mere basis of acoustic or articulatory intuition is much more difficult. This mode of knitting together consonants and vowels varies very greatly according to many circumstances. Each language develops certain traditions of general practice. In English and German both kinds of contact occur frequently, whereas the Romance and Slavonic languages hardly know anything but loose contact. In French as many consonants as possible are usually felt to belong to the following syllable (compare *sa-cre-ment*). Certain cases of word change are due to a particular manner of contact conflicting with etymological division. The Middle-English form of the word *nickname* was *ekename.* When preceded by the indefinite article ("an ekename"), the loose contact between the vowel and the consonant of the article caused the [n] to be felt as part of the following syllable ("a-nekename") and to belong to the noun itself. In the case of loose contact it is not easy to pronounce several consecutive consonants immediately after the vowel. It is quite natural, therefore, that languages with close con-

tacts should be more tolerant in regard to the accumulation of final consonants (compare Eng. *twelfth*, *chests*, *desks*, or Germ. *sprichst*, etc.). This accounts for the loss of many French consonants, as, for instance, in *hors* (*s* is no longer pronounced), *tête* < *teste*, etc.

Doubling of Consonants

Another phenomenon connected with syllabication is that of *gemination* or the doubling of consonants. Of course, we are not interested here in orthographic but only in phonetic doubling. Spelling has many cases of letter-doubling where we actually pronounce only one sound (for example, *better*, *hissing*, etc.). In order to have phonetic doubling of a consonant it is necessary that the syllabic limit be distinctly felt and heard within that consonant, which will, therefore, consist of two parts. According to the syllabic theory we happen to adhere to, the first part of such a double consonant is characterized by a decrease in breath or in sonority or in muscular tension of the larynx, the latter part by an increase in one of these factors. In English there occurs hardly any doubling of consonants, except in compound words, as, for instance, in *bookcase*, *misspell*, or where the same consonant is final in one word and initial in the following, as in the combination *less silver*. In German, French, and the Slavonic languages gemination is equally rare, whereas Italian, Swedish, Hungarian, and Finnish are very fond of it.

Diphthongs

The definition of the diphthong is often derived from the function of two consecutive vowels in a syllable. From this point of view a diphthong is a monosyllabic combination of two simple vowels, one of which is sonant and the other nonsyllabic. Whenever two consecutive vowels are pronounced as one syllable, we have a diphthong. According to whether the first vowel is the syllabic and the second the

nonsyllabic element or vice versa, we distinguish between *falling* and *rising* diphthongs. In English and German the falling type decidedly prevails; compare the words *by*, *boy*, *fair*, *hope*, *cow*, etc., or *Eisen*, *laufen*, *Heu*, etc. The French language, on the contrary, chiefly possesses rising diphthongs, as in *nuit*, *nuage*, *moi*, *soin*, etc. The nonsyllabic element is also called the *semi-vowel*, whose definition is then slightly different from that given above,[57] for in a diphthong like *úo* (German dialect, *múoter*) the consonant is naturally more sonorous than the syllabic sound and its genuinely full vowel quality cannot be questioned. Although in most diphthongs the nonsyllabic element is the more closed of the two and consequently comes nearer both the articulatory and the acoustic characteristics of consonants (narrowing, friction, and resulting noises), the intermediate stage of a genuine semi-vowel is seldom reached. German diphthongs with the letters *i* or *u* as the written second element do not, as a rule, end in the actual pronunciation of an [i] or [u] sound, but in a sound of the more open [e] or [o] type. If, nevertheless, we choose to term them semi-vowels, we can do so only from the relative point of view of their con-sonant function in the syllable.

Without any reference to the syllable a diphthong may be defined as a sound combination beginning with a certain vowel and gliding off or on through gradual transitions to end in another vowel. In this sense diphthongs are in the vowel field the exact parallel of what affricates are in the consonant field. What distinguishes them from two separate vowels are those gradual transitions which are just as characteristic of them as their beginning or end. Their unity is really derived from the fact that they are glides with a distinct beginning and a distinct end.

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[57] Page 31.

CHAPTER II

MEANING

Meaning in General

Approaches to the Study of Meaning

The study of the nature of meaning in language has been unduly neglected, to the detriment of a clear understanding of what language is. Attempts at a definition have not been lacking, but because they were prompted by and based upon preconceived theories in the realm either of logic or of psychology, they naturally had no more than transitory value. To consider meanings as mere forms of thought, subject to logical analysis and definition, is nothing short of hypostatizing mental abstractions and transferring them into the field of language. Intrinsic properties of things and events, logically arrived at, are not expressed by or contained in words, nor are meanings independent entities existing in a logical world and obeying laws of their own. Psychologists have devised an elaborate terminology with the hope of giving an account of the "process" of meaning in terms of impressions, images, concepts, and their apperception, association, assimilation, complication, etc. No doubt psychological theories have contributed greatly to the understanding and formulation of our conscious and subconscious states and activities. Nevertheless the very process of meaning remains a mystery to which the key has not yet been found. However disconcerting this may be, it is more so for the psychologist than for the linguist. The student of language as such is only indirectly concerned with the psychic processes themselves; he is more

immediately interested in the linguistic facts and their mutual relationships.

The best approach to the subject seems to lie in properly locating semantic phenomena among other facts with which they have certain basic features in common. Language has often been compared to a system of signs; terms like "symbol," "symbolization," "signification," have long been familiar ones in the vocabulary of the linguist. Yet it has not been clearly realized that the general and specific study of signs and their relation to what they stand for is apt to shed considerably more light upon meaning in language than the most subtle analysis of thoughts, concepts, psychic images, or impressions. Semeiology, the science of signs and symbols, is only in its infancy; its accumulated data are yet too limited and sketchy to permit any exhaustive and final treatment of the problem. In the following pages our aim is simply to give a very general outline of its various phases.[1]

External and Psychological Contexts

Suppose we see an apple for the first time. We notice a certain color or combination of colors, a certain shape, a certain size. We bite into the apple and a certain taste accompanies our action. The experience is repeated a second time, a third time, and so on. We find that the shape varies to a certain degree but is characteristically similar in many respects; that the colors may be different shades of green, red, yellow, white, but never purple or black;[2] that

[1] The interest in the nature of signs is very old, but their scientific study is recent. *Cf.* Wilhelm Windelband, *Lehrbuch der Geschichte der Philosophie*, pp. 170, 288; Rudolf Eisler, *Wörterbuch der philosophischen Begriffe*, under "Zeichen."

[2] The pomologist might object to this statement, but our purpose here is not to give a scientific description of the properties of the apple; it is merely to explain the genesis of the popular meaning of the symbol [æpl] (*apple*).

the size varies within definite limits; that the taste presents differences but always remains of the same type. If now, for convenience sake, we group the shape-color-size together as one fact visually experienced and consider the taste as another fact, we notice that there is a mutual relation between them: provided we bite into the apple, the taste immediately follows, accompanies, or precedes the visual perception. The two experiences, size-shape-color on the one hand and taste on the other, form a context of facts linked together by a relation of proximity in time. We call this an *external context* of related facts. To it corresponds a *psychological context* which is the result of these external facts being stimuli and causing corresponding excitations within us. The residual traces of such previous excitations may be conveniently termed *engrams*, of which it is a characteristic feature to cluster together so that one member of the context automatically calls up the other or others; one is said to be the *sign* or *meaning* of the other. In the illustration chosen above the size-color-shape experience is the sign of and means the taste experience and vice versa.

Properties of a Psychological Context

1. *Relationship between Facts.*—However, several conditions are required in order that a psychological context may be formed. In the first place, a certain relationship between the facts must exist. It is by no means necessary that this be a relation of cause to effect, even if we should choose to give these terms the most uncompromising interpretation. Any kind of relationship may serve the purpose—succession, simultaneity, causation, spatial proximity, etc. No general rule can be given; what relationship actually results in the formation of a context depends upon the individual experience and can be determined only through an examination of the latter. That we link the crowing noise with the

presence of a rooster is because we once or repeatedly had the visual experience of the animal in the act of crowing and the auditory experience at the same time. Seeing a rooster today and hearing a crowing next week, these two single and separate experiences would not result in a psychological context linking them together.

2. *Frequency of Experience.*—Another condition concerns the frequency of the experience. Suppose we see a person for the first time, and that at a moment when he is vociferating and gesticulating for anger. The external facts observed are no doubt contextually linked together by a relationship of simultaneity; nevertheless their connection is so loose that it does not give rise to a corresponding psychological context of any considerable cohesion. But a more or less frequent repetition of the same facts will cause the visual experience of the person and the visual-auditory experience of his gesticulations and vociferations to be members of a coherent context, one of which will automatically call up the other. Again, how often the experience has to be repeated depends on its individual character. Sometimes very few repetitions, or even a single experience, will suffice.

3. *Uniformity of Occurrence.*—Furthermore, it is necessary that the experiences occur on the whole uniformly with their determinative relations. The ring of a bell which would be followed now by a common meal of the family, now merely by the appearance of a child rejoicing at the sound, again by various other experiences, would fail to result in a psychological context of which one member would be the sound experience and the other the experience of a common meal. The lack of uniformity of experiences and their relations either weakens the contextual cohesion, or else it is consciously or unconsciously overlooked as irrelevant, so as to exert no influence upon the psychological result.

Abstraction

The members of a psychological context are not always the exact equivalents of the real members of the external contexts. Assuming that the ring of a doorbell is followed now by the appearance of the butcher, now by that of the postman, again by that of the husband, the wife, a child, etc., the ensuing psychological context will consist of two members, one of which is the engram of the ring but the other of which is neither the engram of the visual butcher experience, nor that of the postman experience, and so on. For none of these specific experiences occurred uniformly. What was uniform in them, however, was that "somebody" appeared after the ring, and it is this *abstraction*[3] that is engraphically embedded in the context.

Complexity of Contexts

In the above illustrations we have assumed the presence of only two contextual members. For methodological reasons this procedure is, of course, justifiable although in actual fact such simple situations hardly ever occur. As a rule, an experience consists of a complicated set of signs and interpretations. Let us again consider the example of the doorbell. The auditory experience of the ring has been interpreted as the sign of somebody's pushing on a button, of the shape of a particular bell, of two wires being brought into contact at a certain point, of somebody's going to open the door or to look through a window, of noticing somebody at the door, etc. This complexity need not disturb us, however; if we decompose the complex sign situation into its constituents, we find a series of more simple situations, each of which is subject to the same method of interpretation.

[3] *Cf.* pages 101, 115, 191. In this connection the reader may be reminded of the famous controversy on nominalism, realism, and conceptualism. See Windelband, *History of Philosophy*, pp. 272*ff.*

Beliefs, False and True, Particular and General

We have said that once a psychological context of a certain cohesion is established, one of its members calls up the other or others. That is what enables us to infer or predict. If we assume a context to consist of the members A, B, and C, a stimulus similar to the original A stimulus will call up the engrams formed by the original B and C stimuli and thus cause us to expect the real emergence of stimuli similar to the original B and C ones. This expectation may be called a *belief*. If what we expect actually occurs, the belief is said to be *true*; if not, it is said to be *false*. False beliefs are possible because of the complexity of sign situations. If what we have interpreted as the ring of the doorbell is not followed by the actual experience of somebody at the door, our mistake may be due to an erroneous interpretation of various constituents of the complex experience. Our initial interpretation of the ring as that of the doorbell may have been false, thus vitiating our entire complex belief; or we may have failed to interpret the ring as following a contact of two wires at any point (short circuit) instead of following such a contact at the point of the button, etc. If we are able to account for the falsity of our belief, the psychological context upon which it was based will not suffer; it will merely be supplemented and complicated with an additional constituent sign situation. If we are not able to explain our false expectation, the psychological context will be weakened, unless other sign situations induce us to neglect and disregard the lack of uniformity as being irrelevant.

The interpretation of the ring of the doorbell as "There is somebody at the door" is a particular belief. To explain it it is sufficient to assume the togetherness of the various members of the psychological context. But from particular beliefs we proceed to general ones, such as "Whenever the doorbell rings, there is always somebody at the door."

These imply more than that the members of the contexts are clustered together; they can be based only upon the fact that these members are inclusive in respect of each other and in respect of all possible cases of a similar character. It is not, however, the task of the linguist to explain how this inclusiveness or general applicability comes to exist.

Sign Situations, Intentional and Unintentional

A thing or event may be a sign in respect of another thing or event either with or without human intervention. If there is no voluntary intervention of man, we may call the sign situation *unintentional*; otherwise it will be *intentional.* In the former case it exists only for the interpreter; in the latter, it exists for both the interpreter and the originator of the meaningful situation. The so-called symptoms of a disease are for the interpreting physician the unintentional sign of this disease; the "Cock-a-doodle-doo" is for the hearer the unintentional sign of the presence of a rooster; gesticulations produced under the stress of a violent passion or emotion "may be" for the observer the unintentional sign of such passion or emotion. In the last example the originator of the sign may in a later mood or state of mind become himself the interpreter of his gestures, but the origin of the situation interpreted was unintentional. On the other hand, suppose that a person willfully gives a sign to be interpreted by somebody else; then the sign situation is intentional and exists for both parties—for example, the use of lights intended to direct railroad or highway traffic, the pointing at something or in some direction with a hand or finger, the use of imitative or purely conventional gestures or sounds for purposes of communication, etc.

Natural and Accidental Characters in Contextual Relations

In an unintentional sign situation the relation between the various members of the external context is always natural,

that is, based upon physical or physiological properties of the sign. In intentional sign situations the relation between their members may be either natural or accidental, or these two properties may be mixed in various proportions. If a person swings a rod in a manner which imitates the action of beating in order to convey to a naughty child an idea of what is going to happen, the sign situation is intentional and at the same time the relation of the sign to what it stands for is a natural one. On the other hand, a red light intended to cause a driving motorist to stop is an intentional sign linked to what it stands for in a purely accidental or conventional way. A mixture of natural and accidental characters in a contextual relation is found in the agreement of two persons that the door to one person's room being left ajar is synonymous with an invitation to the other to come in.

Summary

Before proceeding further it may be useful to summarize the foregoing paragraphs by means of the following more pregnant formulations:

1. Meaning is a phenomenon cognate to sign situations and their interpretation.

2. "A *sign* is a stimulus similar to some part of an original stimulus and sufficient to call up an engram formed by that stimulus."[4]

3. An *engram* is a residual trace left as the result of the excitation by an original stimulus.

4. "A *context* is a set of entities (things or events) related in a certain way; these entities have each a character such that other sets of entities occur having the same characters and related by the same relation; and these occur nearly uniformly."[5]

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[4] C. K. Ogden and T. A. Richards, *The Meaning of Meaning*, pp. 139–40.

[5] *Ibid.*, p. 146.

5. Such a context is *external* if the entities are stimuli; it is *psychological* if the entities are engrams.

6. To interpret a sign means that an engram, member of a psychological context, is called up by a stimulus similar to some part of the original stimulus.

7. Any thing or event is somehow related to some other thing or event and will therefore be a sign if interpreted in respect of this relation. Any experience can be thus interpreted and have meaning.

8. Hence it is evident that in all our life we are continually busy interpreting all kinds of sign situations.

MEANING IN LANGUAGE

Phonetic and Nonphonetic Elements in Linguistic Signs

Let us now see how the foregoing observations can be made fruitful for the study of linguistic meaning. To have a linguistic sign it is of course essential that it should comprise at least one or more articulate sounds. In the complete absence of such phonetic elements we may have so-called sign or gesture languages, but not language in the narrow sense in which speech is its characteristic feature. Nevertheless, factors other than the phonetic may be and usually are simultaneously constituent elements of the language sign. Gestures, facial mimicry, the external conditions surrounding the utterance of the sounds, traditional convention[6] often serve to locate and define the phonetic sign, which could not otherwise be adequately interpreted. The relative proportion and importance of nonphonetic elements with respect to phonetic ones may vary greatly. A person running out of a house while shouting "Fire! Fire!" with a facial expression and gesticulations indicating excitement illustrates a linguistic sign in which the nonphonetic elements

[6] *Cf.* Michel Bréal, *Les idées latentes du langage.*

play a very considerable part; indeed, they are absolutely essential for an unequivocal interpretation. On the other hand, in a statement like "The earth revolves around its axis" the nonphonetic elements are of very little importance compared with the phonetic ones. It is essential, therefore, to realize that the meaning and interpretation of articulate sounds is based not merely upon phonetic contexts but also to a greater or less degree upon what may be called the general situation context.

Intention in Linguistic Signs

A linguistic sign may on occasion be quite unintentional. A person in a high state of passion may utter articulate sounds or words which serve no other purpose than to give vent to the emotion and slacken its tension. The absence of any other meaning may be due either to the fact that the sounds uttered are merely incoherent phonetic combinations or that the reference they would symbolize if uttered in different circumstances for purposes of communication is by no means realized and still less intended by the speaker. Another illustration would be the "Mama" cry of a baby as a purely reflex expression of the need for food. It is to be observed, however, that the cases where a signifying intention is entirely lacking are extremely rare in language and really border on the domain of mere animal expression. Normally language signs are at least partly intentional, that is, they are purposely formed and given in order to be interpreted. This intention need not be conscious; it usually is implicit.

Natural and Accidental Relationships between Linguistic Sign and Meaning

Furthermore, there may be a natural relationship between the phonetic sign and what it stands for, as, for instance, in onomatopœias, in primitive reduplications, in interjections of

the type of "Oh!" "Gee!" *Onomatopœias*[7] are articulate sound combinations formed in imitation of sounds or movements in nature: the words *wow-wow, cock-a-doodle-doo, buzz, hum, dangle* are onomatopoetic. *Reduplication*[8] is the process by which a sound combination is used twice or several times in juxtaposition within the same word: commonly known examples are *pa-pa, ma-ma, mur-mur,* etc. Yet such phonetic imitations of nature are never more than approximations. If they resulted in a perfect correspondence of sign and that which is signified, it would follow that onomatopœias and reduplications would be the same in all languages. Referring to flowing water, the English speak of its *gurgling* whereas the French use the word *glou-glou*; a swinging or jerking motion is symbolized in German by *baumeln,* in English by *dangling.*[9] Nor would an exact phonetic imitation of natural sound be compatible with phonetic change. It is true that onomatopœias are more stable, more immune from the action of phonetic laws than purely conventional symbols, but modifications are known to occur in many instances. In the course of time a certain onomatopoetic coloring may even accidentally become characteristic of a word which originally was without it: compare the French word *glas* ('death knell'), which is derived from the Latin *classicum.*[10] Reversely, originally imitative sounds are liable to lose entirely their onomatopoetic value; this happened with the Vulgar Latin *pīpīo,* as it became *pigeon* in French. Besides, reduplications may express a great many modes or categories, such as plurality, intensity, frequency,

[7] *Cf.* pages 297, 298.

[8] *Cf.* pages 154, 155.

[9] Compare also the French *cocorico,* the German *kikeriki,* and the English *cock-a-doodle-doo.*

[10] "Dans le latin classique, ['classicum' est] le signal donné par la trompette pour rassembler les soldats; dans le latin ecclésiastique [c'était le] signal donné par la cloche pour avertir les moines de se rendre à l'église." Auguste Brachet, *Dictionnaire étymologique de la langue française,* under "glas."

etc. At the origin of speech onomatopoetic and reduplicating signs were in all probability quite numerous; in more advanced stages of civilization they are decidedly a negligible part of language. In most instances sign and meaning are linked to each other by an accidental or a mixed relationship. Nothing in the way of a natural or intrinsic tie can be said to exist between a sound combination like "This table is square" and what it refers to. In such an exclamation as "How beautiful!" the relationship may be relatively natural inasmuch as it is perhaps a reflex expression of an emotive state; it is, however, largely accidental and conventional, because the phonetic sign was originally determined in a conventional manner and was only slowly crystallized into an automatic formula capable of answering an emotional urge.

Direct Contextual Relationship

The relation between the linguistic sign and the extra-linguistic world may present various degrees of directness. When a child utters its acquired speech sounds, it does not do so because of its need to express or communicate concepts or more or less pure references to things or events, but because words are for the child either modes of action which produce or materialize what they stand for or reflex reactions to momentary attitudes, desires, etc. The purely narrative function of speech is only subsequently developed in the course of human growth. To the child words have power; they are the effective means of getting in immediate and familiar touch with what they signify. Very much the same condition obtains in the speech of primitive people, whether savages or illiterate members of civilized communities. Through the names of things they somehow take possession of the things themselves. For them speech is primarily part of the texture of the external world, and the sign becomes almost the equivalent of the real thing. They

feel that they can control the world in which they live in proportion as they are able to force it into the procrustean form of speech. Hence the instinctive respect for verbal expression, the ritual and magic attitude toward words prevalent among primitive people, as well as that embodied in religious tradition. It is a tendency which only very advanced reflection is able to overcome. In some form or other it even plays a rôle in the speaking and thinking habits of civilized man. Owing to it systems of philosophy have tried to populate the universe with really subsistent entities corresponding to words like "goodness," "beauty," and thousands of other purely logical and symbolical combinations or abstractions. It lies at the basis of the awe with which the name of God is treated and of the horror or fear with which words like "hell," "the devil," are used or

FIG. 12

tabooed. And is it not true that the mere name given to a disease or illness often means a distinct relief to the patient and those who care for him because the name is vaguely believed to be equivalent to a mastery and control of that which it designates?

The common feature of all these personifying uses of language is that the relationship between the sign and the thing signified is an immediate or direct one. It may be graphically represented by a straight line connecting the sign and its meaning (Fig. 12). In its genuine purity we only find it in actual speech contextually incorporated in empiric life situations and experiences. Occasionally, when at the height of some emotional condition we exclaim "Damn!" or "How terrible!" etc., the uttered sounds are the immediate expression of our attitude. There is no refraction or deviation in the relation that connects the sound to what it

stands for. That a particular kind of sound combination is used in preference to any other is due to the fact that we have heard or uttered it before in context with a similar attitude. The directness of relation between the sounds and the emotional state is not the result of any natural or intrinsic properties of the sounds as such; it is due to the absence of a certain mental indifference and detachment with regard to both sign and thing signified.

Indirect Contextual Relationship

On the other hand, conditions are quite different in the narrative and reflective use of language. When speech is a means of communicating thoughts or experiences in a manner of greater detachment from the empiric situation, the relationship between the sign and what it stands for is less immediate, more indirect. In direct sign contexts a certain phonetic stimulus immediately calls up an engram similar to that produced by the original perception of the thing signified; in narrative speech the mind merely "refers" to such a perception or thing. When I say "A birch is a beautiful tree," the phonetic stimulus does not necessarily call up the engram of a particular visual experience of a birch or of a tree; it is likely to cause simply a *reference* to them and to their relationship of subject and predicate. This act of reference is neither an actual tree, nor its perception, nor the engram of its perceptual experience, but only a mental direction toward them or the engram of such a direction. The relation that connects the sign to what it stands for is broken, so that the sound combination primarily symbolizes a mental reference and only through this refers to a thing or event. There are three terms in the makeup of such a context: the phonetic sign, which we now call a *symbol*, the reference, and the *referent* or that which is referred to.

A referent is thus considerably more detached from its symbol than is the sign from the thing or event signified.

Whereas the diagram of an immediate sign context reveals a straight line, that of a symbol context presents the form of a triangle, the base of which is not filled (Fig. 13). To a certain extent, it is true, a direct relationship between symbol and referent is realized in the case of onomatopœias used in narrative speech. But here the directness is not the result of

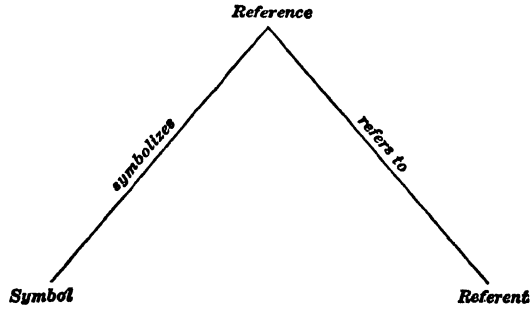

FIG. 13

the absence of a reference; it is derived from a natural connection between referent and its phonetic imitation.

Correctness and Adequacy in Symbol Contexts

The symbol may symbolize the reference *incorrectly* while the reference itself *adequately* refers to the referent. Here is an illustration. In Germany the ground floor is not numbered as a story, so that what is called the second floor in America corresponds to the first in Germany. If, now, a German living in America and forgetful of this difference says "I live on the second floor," meaning the second story above the ground floor, he will be misunderstood. His reference is perfectly adequate, but his symbol is incorrect. Reversely, the symbol may be correct in regard to the reference while the latter inadequately refers to the referent. A person not familiar with the actual relationship of the sun to the earth may say "Every day the sun turns around the

earth from east to west" and mean his statement to be taken literally. His reference is correctly symbolized, but it inadequately refers to the referent. The symbol in such a case is not incorrect, but the reference is untrue or false.

Relative Importance of Phonetic and Nonphonetic Elements

It is worth noting that the more immediate the relationship between sign and thing or event signified, the less important the phonetic part of the sign. As a matter of fact, the referential value of the sounds uttered often openly conflicts with their immediate sign value. The expression "Go to hell!" uttered in a moment of impatience to a friend obviously does not mean what the sounds as symbols would stand for in narrative speech. It might as well be replaced by "Go to heaven!" and still have the same meaning, namely, a certain attitude of the speaker. In order to interpret a linguistic sign it is essential to be aware of the conditions, both subjective and objective, in which it is placed. Knowledge of the language as a system of sounds, words, etc., would be absolutely insufficient for an adequate interpretation. On the other hand, the more purely indirect and strictly referential the linguistic context is, the more important the phonetic part of the sign. In scientific or strictly narrative language the meaning is primarily expressed by means of phonetic combinations. But in ordinary speech pure linguistic sign situations as well as purely referential symbol situations are extremely rare. Sign contexts and referential symbol contexts are continually blended. A sentence like "The sun is shining" usually symbolizes a reference to a fact and is at the same time the immediate sign of an emotive attitude. If said by a child longing for an opportunity to play outdoors, the attitude expressed is one of joy; if uttered by a farmer looking for rain, the corresponding attitude is one of disappointment. A great many misunderstandings are due to the fact that this blending of the emotive

and the referential functions of speech are not realized by the interpreter, who does not properly disentangle the sign situation from the referential meaning of the symbol.

Diversity of Speech Functions

Speech may express the speaker's attitude toward the hearer(s) or toward the referent. Thus, the linguistic signs that we use will be different when we address a large crowd or an individual, a superior or a subordinate, a friend or a foe, etc., even though the referential meaning of the symbols be the same. Similarly, if we speak about a person or a thing, our symbol will vary according to our attitude toward that particular person or thing.

Moreover, speech symbols do not always convey a referential meaning or express an emotive attitude; they are also resorted to for the purpose of promoting certain effects. Our intention may be quite different from the reference we make or the attitude we express. If a child wants dad to take him out for a ride, the child's intention may be expressed by such a sentence as "The sun is shining" or "It is fine weather today." To be sure, such a sentence may referentially state a fact, it may be the sign of an attitude of the child toward daddy or toward the weather, or it may combine these three functions; but its primary meaning in this instance is to determine daddy for a motor trip. In reality the sun may not shine very much or the weather may not be so fine after all. And so we see that the functions of speech are diverse and that the symbols or signs as well as their meanings depend to a great extent upon their function or functions.[11]

Speaker's and Listener's Meaning

In the foregoing discussion we have often distinguished between speaker and listener(s). This distinction is so

[11] See also Frédéric Paulhan, *La double fonction du langage.*

important that we must now focus our attention upon it more closely, as the meaning of meaning is not the same when applied to the speaker and to the interpreter.[12]

1. *In Emotive Speech.*—First of all let us consider a sign situation in which an attitude of the speaker is signified. The attitude, then, calls up the sign, which consists partly of articulate sounds and, to a greater or less degree, of other situating factors. Occasionally, of course, a speaker may employ a sign in order to evoke within himself a corresponding attitude, but this is comparatively rare. As far as the listener is concerned, it is obviously the sign that calls up the attitude. For the speaker the sign is the expression of the attitude; for the hearer the attitude is the meaning of

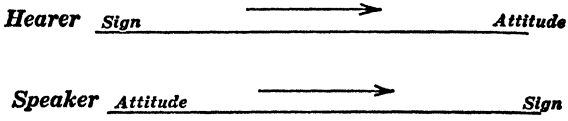

FIG. 14

the sign. When language is used in the function under consideration, interpretation and actual speech proceed in an opposite direction. Graphically this may be represented as in Figure 14. With the speaker the attitude is the result of other linguistic or nonlinguistic experiences; the sign is determined by engrams of previous sounds, gestures, facial expressions, etc., in context with a previous similar attitude. In order that such a sign be correctly understood, the following conditions are required: (*a*) the interpreter must know the language used by the speaker, so that the referential value of the sign may be interpreted in respect of a possible attitude; (*b*) the gestures, facial expression, environment, etc., must be correctly interpreted in connection with the

[12] This is a frequent occasion of semantic change. *Cf.* page 311.

phonetic part of the sign; (*c*) this double interpretation will be greatly aided by knowledge of the experiences that have caused the attitude in the speaker. In other words, the interpreter has to combine the knowledge of a linguist, the clairvoyance of a psychologist, and the shrewdness of a detective. Inasmuch as the sign is one that has been conventionalized by the community to which both the speaker and the hearer belong, the interpretation will be comparatively easy and fairly accurate. In proportion as the sign is more individually spontaneous the interpretation becomes more difficult and open to errors. In order to eliminate

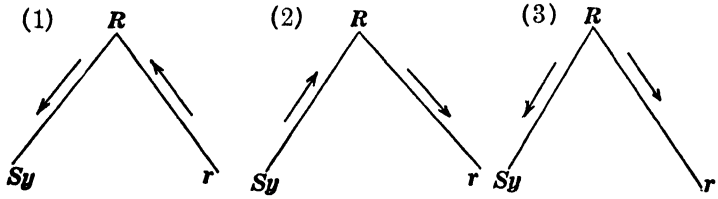

FIG. 15

these errors the sign must be enlarged by more or less numerous other phonetic or nonphonetic features.

2. *In Narrative Speech.*—If the function of the speaker's utterance be the conveying of a thought by means of a referential symbol, the situation is more complicated. On the part of the speaker (1) the reference (*R*) may be caused by the referent (*r*) and thus cause the symbol (*Sy*); or (2) the reference may be caused by the symbol and thus refer to the referent; or (3) the reference to the referent may precede and cause the symbol. These three cases are illustrated in Figure 15. On the part of the hearer the symbol causes the reference which thus refers to the referent (Fig. 16). In order that such a symbol be correctly understood, it is necessary (*a*) that the relationship between reference and referent be adequate and that between symbol and reference be correct;

(*b*) that the interpreter know the common referential value of the symbol, that is, that he know the language used by the speaker; (*c*) that the interpreter be familiar with the particular level of symbolization of the speaker and the particular universe of discourse in which his thinking moves. If we suppose the second condition fulfilled, the facility and accuracy of interpretation increases in the same degree as the correctness of the symbol, the adequacy of the reference, the harmonic correspondence between the levels of

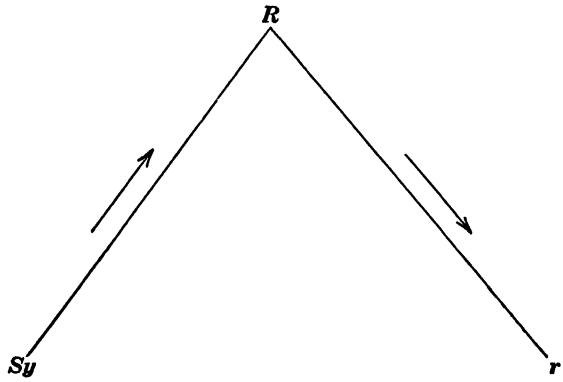

FIG. 16

symbolization and of interpretation, the correspondence between the speaker's and the hearer's universe of discourse. If misunderstandings arise, they must be eliminated by expanding the phonetic symbol, by the use of synonyms, and by recourse to definitions.

3. *In Promotive Speech.*—The promotion of effects may be the function of speech in two different ways: either directly, by means of an explicit order or wish, or indirectly, by means of a hint. In the former case the referential function coincides with the intention, and consequently the problem of the difference between the speaker's and the

hearer's meaning has to be solved according to the principles given in the preceding paragraph. In the latter case the speaker's utterance has a double function: a secondary one, either emotive or referential, and a primary one of intention. The secondary function is, of course, governed by the rules of expression, symbolization, and interpretation as given in

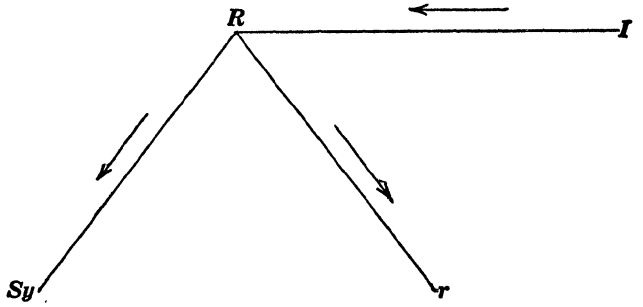

FIG. 17

the two preceding paragraphs. As far as the primary function is concerned, the situation will generally be as follows: On the part of the speaker the intention determines the reference, which thus causes the symbol and refers to the referent (Fig. 17). Or, the intention (*I*) determines the attitude (*A*), which thus causes the sign (*Si*) (Fig. 18). On the part

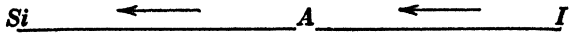

FIG. 18

of the hearer the symbol causes the reference, which thus refers to the referent and is the sign of the speaker's intention (Fig. 19). Or, the sign indicates the attitude, which in its turn signifies the intention (Fig. 20). In order that such an utterance be correctly interpreted, it is necessary that the interpretation of the emotive sign situation or of the referential symbol situation as such be correct; but in addition

the attitude expressed or the reference made must be correctly interpreted in respect of the intention. This is possible only through the interpretation of various other sign situations, which are no longer purely linguistic but circumstantial. The facility and accuracy of interpretation increase with the degree of relational closeness that exists

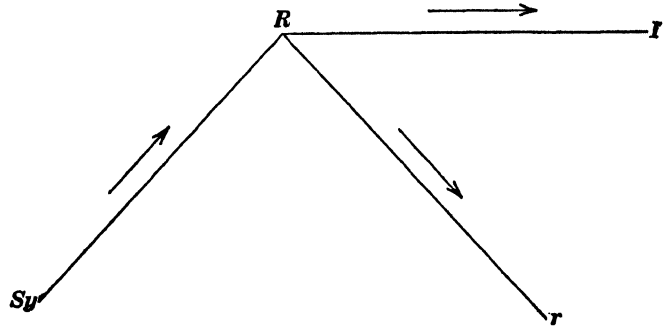

FIG. 19

between the reference or attitude on the one hand and the intention on the other, and with the knowledge and understanding of both subjective and objective circumstances by which the reference or the attitude is surrounded. It is clear, therefore, that in this connection the interpretation of

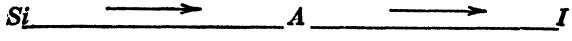

FIG. 20

nonlinguistic sign situations is likely to be at least of equal use with the knowledge of the language spoken, and that misunderstandings are apt to be more frequent and more obstinate. In order to eliminate such errors the speaker must make other references or express other attitudes which are more closely related to his intention, or the surrounding circumstances must be made more relevant.

Common Meanings of Language Forms

It is now easy to see what is meant by the so-called common meanings of words and other forms of language. They are relatively fixed references (respectively, attitudes) or sets of subjectively related references (respectively, attitudes) which, as a result of many experiences of speech and interpretation by many individuals, have become linked to more or less fixed symbols (respectively, signs). However, since these experiences are ever increasing and changing, common meaning is only relatively fixed; it is subject to modification in the course of time.

It is evident, furthermore, that immediate sign contexts occur only in speech, whereas referential symbol contexts play their part in actual speech as well as in mnemonic and systematic abstractions and groupings of common linguistic elements. This leads us to investigate the difference with which meaning applies to the single word and to the spoken sentence.

CHAPTER III

UNITS OF SIGNIFICATION

The Word and the Sentence

Phonetic and Semantic Requirements for the Word

We are not concerned here with the problem of the origin of the word. The question how the word came to be is just as immaterial for the understanding of what it is as knowing how primitive man built his first shelter is unnecessary in describing a modern apartment house. We may note, however, that although history is unable to give us the least information concerning this point, the principles of social psychology plead for the priority of the sentence to the word.

Definition Limited to the Static Word

The unstable or evolutionary character of language should not be allowed to present the word to us only as a vacillating entity, thus discouraging all efforts at a definition. It is undoubtedly true that language is continually subject to change, but it is no less evident that this change is noticeable only in retrospect. At any given period the members of a speaking community are conscious of using the same language. Only linguists are aware of its ephemeral character, and their influence is comparatively small. The language-making multitude work with linguistic material which to all intents and purposes they feel to be stationary. The changes for which they are responsible are perfectly unconscious and unintentional. For them the word has a current value. And, indeed, but for that relative stability language would be a chaos unfit for social communication. When we trace a

word back to what it was five hundred years ago, each link really represents a relatively static word current at a certain period. The historical interpretation is only the observer's privilege. Hence the definition of the word can apply only to a relatively static entity. The introduction of the historical feature inevitably obscures the issue.

Phonetic Requirements

The first requirement, then, in order to have a word is some articulate sound or sounds. In this sense (that is, as a mere shorthand term for the phonetic aspect of the word) it might be justifiable to speak of a "phonetic word"[1] if there were not other reasons for avoiding such terminology.[2] But the questions which and how many sounds are required and sufficient have unfavorably affected many a discussion of the subject. It seems appropriate, therefore, to emphasize the fact that neither a particular quantity nor a particular quality of sound is essential to the word. A small house built of wood or brick is a house just as well as a large one of stone or concrete. Both the number and the sort of sounds required for a word are determined by external circumstances and conditions.

Historical grammar and etymology explain a good deal about these points. Factors of importance are the phonetic material that a language has at its disposal, the habits of combination and reference, of differentiation and unification, of isolation and demarcation, prevailing in a language at a given time.

Phonetic Quantity and Quality

The verbal material consists of sounds and phonetic combinations. But we have seen that each language operates

[1] *Cf.* e.g., Joseph Vendryes, *Language*, tr. Paul Radin, pp. 56*ff.*; E. W. Scripture, *Elements of Experimental Phonetics*, p. 127.

[2] *Cf.* page 99.

with a comparatively small number of sounds, which are, moreover, systematically grouped according to their articulatory, auditory, and psychologically contextual properties. Phonetic combinations may enter wholesale into the formation of words, but again their number as well as their kind is peculiar to each language. Like sounds, they are grouped and systematized in the minds of the speakers. Sounds and sound combinations are combined with other sounds and other combinations in a way determined by certain general and specific habits. If these habits are dependent upon general motor and acoustic conditions, they are common to all languages; thus, a succession of syllabic and nonsyllabic sounds is necessary in any word of a certain phonetic extension. But it is a result of specific combining habits that in English [pn], [ps], [ʃt], [ʃp], [kn], [gn] are never at the beginning of a syllable; that in Italian consonantal clusters are very rare and a consonant is hardly ever at the end of a word; that other languages favor consonantal accumulations, etc. Similarly, the phonetic combination *-able* [əbl] in English can be made a constitutive element of a word only under certain conditions. The habits of symbolization and reference also help in determining the phonetic character of the word. This is particularly obvious in the case of onomatopœias and primitive reduplications. The facts that in English symbolization is frequently obtained through borrowing and that in German its ways rather lead to compounds and derivations determine the acoustic and quantitative character of many an English and German word. Moreover, the differentiation of sounds within the word is governed largely by special habits. In German [p] is seldom, in English it is often, used as a differentiating sound of [b] (compare the English words *bat, pad, bad, pat,* which sound much alike to speakers of certain High German dialects). But, in addition, words are phonetically differentiated from other words by certain means of parallelism and contrast. In this manner they, too,

are systematically grouped. Thus the sound combination *cut* [kʌt] is contrasted with all other monosyllabic stems of the same type, such as *boot, eat, hut, but,* etc., from which it is distinguished in its acoustic and articulatory properties. The phonetic extension of the word is partly defined by such other forms as *cutting* [kʌt-ɪŋ], *cutter* [kʌt-ə(r)], *cuts* [kʌt-s], etc. If I substitute [g] for [k] or [æ] for [ʌ] or [d] for [t], the change is not only immediately noticed, but vigorously resisted by the emergence of such phonetic symbols as *gut* [gʌt], *cat* [kæt], *cud* [kʌd]. To be sure, the systematization of words is less strict than that of sounds or morphological elements.[3] If in the given word I replaced [t] by [θ] or [k] by [t], the disturbance would no doubt be observed, but it would be tolerated with considerably greater complacency. Whatever resistance would then be felt would come from the sound system rather than from the word system. In spite of this restriction, however, the phonetic word symbol is in a large measure defined as to its extension and quality because it is surrounded by other words in the system. As to the habits of unification, they find their primary expression in accentual conditions, the influence of which upon sound quality and word quantity is universally recognized. Finally, the defining effect of the prevailing habits of isolation is very evident if we compare so-called synthetic languages with analytic ones. In the former a greater number of sound combinations are isolated and grouped as radical and formative elements;[3] in the latter the process of isolation mainly enriches the ready-made vocabulary. There the whole words that enter into the sentence are few, here the sentence absorbs many. This, of course, entails different habits of demarcation: within the same language "morphological" words are likely to be longer than those which are the immediate result of isolation.

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[3] *Cf.* pages 136, 140*ff.*

The Phonetic Minimum

If it is true that the phonetic quality and quantity of a word are determined merely by external circumstances, it is plain that they can change in any direction according to changes of these circumstances. But a reduction of sound to zero is incompatible with the concept of the word. The expression "semantic word" can only be a shorthand term for the semantic aspect of the word. A definition that neglects the phonetic feature is necessarily inadequate. This does not imply a belief in a subsisting essence or in subsisting essential properties of the word, or in a correspondingly intrinsic relation of the symbol "word" to such essence or properties; it only means that the sound combination "word" is the symbol for a compound generalized reference which is the result of a considerable number of referential experiences, a common feature of which is "some articulate sound or sounds." It is this common feature that belongs in a definition of the word, while the changing ones of phonetic quantity and quality are temporarily cancelled. A desire for inclusion of the latter features in the definition could be met only by an elaborate description of the above-mentioned and possibly other determinative factors. But if we anticipate our conclusion that the word is primarily a systematic entity, we may add that its phonetic part is relatively defined in every individual case. Hence the above-mentioned common feature may be expanded as follows: "some definite articulate sound or sounds."

Semantic Requirements

At first blush it would seem superfluous to say that sounds without standing for or referring to something do not constitute what we term a word. But there are good reasons for insisting upon this point. Not only does popular speech freely identify the word with its sounds, but teachers of

spelling and pronunciation, nay even linguistic scholars, often speak of words as if they were mere phonetic entities. Especially historical linguists, with their dependence upon written documents and their desire for tangible and clear-cut data, are liable to study sounds instead of words. Etymologizing is only too often nothing but an application of phonetic laws or formulae. It is forgotten that such work is mere pioneer work, destined to clear the way for more comprehensive solutions. That is why many historical phonetic studies are so dead and devoid of human interest. On the other hand, semanticists often look at so-called meanings as if they were realities by themselves, not symbolized entities both genetically and statically bound to their symbols. Is it to be wondered at that linguist and psychologist are so often at variance? It is for these reasons, that is, because of the danger of strengthening a one-sided and erroneous tendency, that the expressions "phonetic word" and "semantic word" should be removed from our linguistic vocabulary.[4]

But the relation of sounds to what they stand for or refer to is not an essential or necessary one. Generally speaking, the sound is neither causatively produced by any reference, nor does the latter call for any specific sound. The relationship between the two is of a purely contextual character. Certain sounds have on various occasions been found to be used in context with a certain semantic value, so that gradually one has become the sign or the symbol of the other. Such contexts may, of course, present many degrees of immediacy or complexity. This leads us to inquire what kind of "meaning" must be contextually related to corresponding sound(s) in order that we may have a word and how this meaning of a word differs from the meaning of a sentence.

[4] *Cf.* also L. Weisgerber, "Vorschläge zur Methode und Terminologie der Wortforschung," *Indogermanische Forschungen*, Vol. 46 (1920), pp. 305–25.

Emotive and Referential Meaning of the Word

Concerning language in general, it is doubtless possible for sounds to be in an immediate sign context with a certain attitude of the speaker and to be directly evocative of a similar attitude in the listener. This attitude may be primarily expressive (for instance, of joy), or communicative (for instance, of an order), or both expressive and communicative at the same time. If, however, we confine our study to the single word, it seems hardly possible to find an instance where all the "meaning" would be emotive. Some reference will be found to be present, either exclusively or combined with emotive coloring. So-called "nursery words" as well as primitive action words, which may lack all referential value, are really sentences, not single words.[5]

The reference or references with which a sound or sounds are in context may be obtained more or less directly as a result of very few experiences. This happens with proper names or with such a word as *sun*. For common nouns whose referent is a substantial object (for example, *house*, *tree*) a larger number of experiences are required in order to obtain a symbolized reference. The complication increases when varied groupings of experiences have to take place so that only certain of their common elements survive in isolation while all the differentiating features are cancelled (for example, *offspring*); or when part of one context is taken hold of by and embedded in another context, as, for instance, in compounds (*schoolboy*) and in metaphors (*chairman*); or when nonsubstantial references are abstracted from a considerable variety of different contexts or groups of contexts, as happens with words of the type of *truth*, *greatness*, *religion*, or with adjectives, prepositions, etc., whose degree of abstraction is sometimes very advanced.

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[5] *Cf.* pages 298, 323.

Abstraction

It is to be observed that in any single word we are in the presence of some degree of abstraction. Even the symbols *Peter* and *Paul* denote specifically only when used in a properly situated speech context; part of their connotation may be temporarily cancelled in any given piece of speech. Word references, however concrete, are of some complexity which needs the sentence for its reduction to unequivocal simplicity; otherwise they are not really words but mere names, not translatable but only transferable wholesale from one language to another.[6] Most proper names are actually more than mere names. The symbol *Napoleon* symbolizes a very complex reference almost invariably complicated with emotive contexts. The reference symbolized by *house* is obtained only after the cancellation of the differentiating features of various contextual experiences, each linking the symbol to a specified reference. The abstraction in the case of a word like *offspring* is evident, since it may stand for a son as well as for a grandson, etc. Upon the abstracted character of the other types of references it is needless to insist. But abstraction means the provisional disregarding of differences and the retention of common features alone. At any time, however, some of the differences may be included in a specified reference by means of the sentence. Abstraction, therefore, implies ambiguity or rather *polysemy*, multiplicity of meaning, and it seems that the latter property is a common characteristic of the single word, no matter how concretely restricted its meaning.

Polysemy

This becomes the more evident if we consider that the word symbol isolated from all sentence contexts may sym-

[6] *Cf.* Hermann Ammann, *Die menschliche Rede*, I, pp. 66*ff.*

bolize at different levels of reference or interpretation. The sentence has at its disposal all kinds of possible expansions and other means of locating the reference in all relevant respects. The single word has not, except to a certain degree where the linguistic system allows of previous systematic specification by way of word composition or otherwise (compare Germ. *Mann* and *Kaufmann*). A product of the latter type, however, is still a single word, because the more specific location of the reference is achieved by a systematic, not by a free, procedure, and since a further expansion or situation remains necessary for relevant communicative purposes. The isolated word symbol may even stand for more than one referent and yet be felt to be the same word; thus, in English *wood* may stand for the same referents as the two German symbols *Holz* and *Wald*. The criterion of differentiation between isolated word symbols does not coincide with that between sentence symbols.[7] Within the sentence one symbol can stand for only one referent,[8] but outside of connected speech one symbol standing for several referents will be called the same word if the speaking community is still aware of the process by which one referent has been substituted for another. That is why, for instance, *ball* (Fr. *la balle*) and *ball* (Fr. *le bal*), even when considered in their isolation, are two different words. Finally, the polysemy of the single word is intimately connected with the facts that a symbolic reference context may be complicated with various emotive sign contexts and that metaphorical complications may be present in any degree.

Limitations to Polysemy

And yet the polysemous character of the single word is limited. Again, however, this limitation is conditioned by

[7] *Cf. ibid.*, I, p. 46.
[8] *Cf.* C. K. Ogden and T. A. Richards, *The Meaning of Meaning*, pp. 187*ff.*

external factors. Semantic history has evolved the word references with which we now operate. In English the symbol *house* may symbolize a reference to many different kinds of houses; metaphorically its reference may be so generalized as to refer to many more other things; but it can hardly ever have the same reference as, let us say, *bread* or *dust*. Thus, the referential habits at a given time in a given community define the references made, even when the referents are the same as those of other periods or other communities. Compare the German word *Land* with English *land*, the French *contrée* with the English *country*, Mod. E. *flesh* with A.-S. *flæsc*, etc. That entirely unrelated referents give rise to different references is self-evident. This gives the study of single words a high value for the understanding of cultural conditions. Moreover, referential differentiation and grouping are determinative of word meaning. Like the phonetic symbol, the symbolized reference is grouped in systematic contexts. The reference of the word *house* is to a great extent defined by the references of such symbols as *hut, cottage, palace, bungalow*, etc., which cluster together, partly overlapping, partly defining each other. In English the pronoun *we* presents a referential aspect of plurality or 'more than one' because the only contrasting form is the singular. If the English language had a dual, the plural *we* would imply the referential aspect of 'more than two.' The fact that *we* is only the subject and predicate form is partly due to the existence of the contrasting object form *us*. If this were lacking, as is the case in French, the referential field of *we* would *ipso facto* be changed. If we had a special polite form for the speaker's person, as is the case in Basque,[9] *we* would lose part of its reference complex. English *I* does not symbolize the same reference as French *je*, which can be only subject, not predicate. The mere loss of *thou* has

[9] *Cf.* Abel Hovelacque, *The Science of Language*, p. 119.

enriched the reference of *you*. Again, the habits of referential isolation will have a determining effect upon meaning. Primitive people isolate comparatively few references, and where they do, the isolation is not so complete as it would be in civilized communities. The result is that polysemy and consequently ambiguity are not so pronounced in their single words. But a certain degree of isolation and abstraction is necessary to any word; otherwise the same word could not be used in different sentences with special references, and every sentence could consist of only one word, either simple or obtained by a previous systematic combination of radical and formative elements. In that case there would not be any real words, but only sentences.[10] And so we see that the referential range of the single word is determined by many circumstances, but that neither the kind nor the degree of complexity of the reference is a common referential element of the symbol *word*. We may conclude, then, that the single word consists of "some definite articulate sound or sounds in a polysemous context with some complex but limited reference or references."

Systematization in Language

Phonetic Systematization

In the preceding paragraphs we have repeatedly mentioned the systematic grouping of such linguistic elements as the sounds, the radical and nonradical parts, and even the words. We believe that this distinction between speech and system should be insisted upon in order to arrive at a definition of the word as an isolated entity. It was as a reaction against the overemphasis laid upon historical facts of language as transmitted by literary documents that modern linguistics turned its attention to the actually spoken word.

[10] *Cf.* Ammann, *op. cit.*, I, pp. 29, 30, 44*ff*.

Language, it was maintained, is not a thing but an activity; speech is preëminently the form of language. Unfortunately this reaction, like many others, went too far. It resulted in blurring a fundamental distinction without which the study of language is doomed to inextricable confusion. Speech is a psycho-physical activity, the system a purely psychic grouping of mentally deposited data abstracted from speech.[11] Historically speech precedes the system; without the former the latter could not come into existence or develop. But once it is there, the system is decidedly distinct from that to which it owes its existence. Moreover, in its turn it exerts its influence upon speech. In order to become a language speech cannot possibly do without the system. It is what gives consistency and coherence to language. Without the system it is hard to see how speech could become a means of continuous social intercourse. We can know and to a high degree understand the system of a language and yet be unable to speak or understand the language itself. Common speech elements are isolated and embedded in systematic psychological contexts whose characteristic it is to be stable by nature. Whereas in speech both the symbols and the references are temporarily defined and specified by an ephemeral context, systematic contexts result from an abstraction of the common elements of several or many speech experiences and are mnemonic. Speech contexts are formed for the purpose of momentary expression or communication; the purpose of system contexts is to group, to combine, to record, and to store. We have had previous opportunities to observe that single sounds never escape a thorough systematization in any language.[12] A systematic sound context consists of two or more different sound sensations which

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[11] *Cf.* Ferdinand de Saussure, *Cours de linguistique générale*, pp. 170*ff.*; H. J. Pos, *Zur Logik der Sprachwissenschaft*, pp. 53*ff.*

[12] *Cf.* pages 306*ff.*; Edward Sapir, "Sound-Patterns in Language," *Language*, Vol. I (1925), pp. 37–52.

define each other in a great variety of ways. Thus, for instance, *p* is brought into relation with *b* in some such contexts as "*p* is not *b*", or "*p* : *t* = *b* : *d* = *f* : *v*", or "*p* is close to *b*", or "*p* is very distant from *b*", etc. Because single sounds by themselves have no referential meaning and because their quantitative extension is reduced to a minimum, their contextual groups are homogeneous and comparatively simple; that is, a sound is in systematic contexts with only one or more other sounds, and its entire indivisible entity is systematized. That is why the phonetic system of a language at any given period is very strict and closed; it is rare for a strange sound to find its way into it, a fact much appreciated by the classifier of languages.

Syllabic Systematization

As for the syllable, it is not systematized at all. Whereas the sound is realized in language in two different functions, namely, as an element of speech and as a systematically grouped entity, the syllable does not exist outside of the spoken language or outside of systematic units of which it is merely a quantitative part. A word like Engl. *come*, or even a sentence consisting of only one syllable, for example, the imperative *come!*, derives its unity from its semantic character, not from its being a syllable. The sound combination [lat], if considered quite apart from any word, speech, or other empirically phonetic surroundings, cannot be said to be a syllable. In the French word *latte* it is one; in the French *latin* it is more, since the [t] belongs to the following syllable of the word. The reason why sound combinations are not systematically abstracted and grouped as syllables is obvious. The human mind abstracts and systematizes only units. But an isolated succession of sounds without any unifying semantic principle is no unit; it is just a decomposable sum of phonetic symbols. In order to become a syllable, that is, a distinct unit, it either needs further expansion in a

speech context so that an alternation of tops and depressions takes place, or it must obtain its unity from its meaning as a semanto-phonetic entity. As such, however, the syllable is a phonetic, not a semanto-phonetic unit.

Semanto-Phonetic Systematization

When semantic elements are connected with sounds, the systematic grouping may affect many different parts of the combination and leave others unaffected. In semanto-phonetic entities some or all of their phonetic parts may be contextually linked to one or more other phonetic elements or to a number of semantic ones. Reversely, some or all referential parts may be in systematic contexts with one or more other semantic elements or with a number of phonetic ones. Their systematic contextual groups are much more complicated, but their systematization is less strict, less thorough, and more diffuse. In this respect morphological elements as such occupy an intermediate position between single sounds and finished words. For the systematic contextual grouping of finished words may leave any number of their phonetic or referential parts free and untouched by the system, whereas radical and formational elements are at least strictly systematized with respect to each other. If we represent the referential aspect of semanto-phonetic parts by capitals and their phonetic aspect by small letters, and if we place the formational elements between parentheses, leaving the radicals free, we can formulate some types of their possible contexts as follows, taking Latin as the exemplified language.

(-I) : DOMIN- = (-AE) : ROS- = (-US) : DOM- = (-IS) : ARBOR-, etc., or
(-I) : (-US) : (-O) : (-UM) in regard to DOMIN- = (-AE) : (-A) : (-AE) : (-AM) in regard to ROS-, etc., or
(-i) : domin-DOMIN- = (-ae) : ros-ROS- = (-us) : dom-DOM- = (-is) : arbor-ARBOR-, etc.,

or, in regard to the given radicals,

(-i) : (-I) = (-ae) : (-AE) = (-us) : (-US) = (-is) : (-IS), etc., or
(-i) : domin- = (-i) : arbor-, but (-I) : DOMIN- ≠ (-I) : ARBOR-, and consequently
(-iI) : domin-DOMIN- ≠ (-iI) : arbor-ARBOR-, etc.

If we wish to illustrate English contexts, we may, for example, choose the words *tree, book, house, ox,* and *mouse* with their corresponding plurals, and the verb *give* with its third-person present indicative singular. Although we shall represent these words with their phonetic symbols, we shall dispense with our usual brackets in order to avoid loading the formula with unnecessary complications, and furthermore, because of our need of capitals in this instance, we shall not discriminate between [i] and [ɪ], [u] and [ʊ], but use only the two symbols [i] and [u], with their corresponding capitals for the referential aspect: thus *book* = [buk] instead of the more correct [bʊk]. And so we may get the following:

(-z) : triˑ-TRIˑ- = (-s) : buk-BUK- = (-iz) : hauz-HAUZ- = (-ən) : ɔks-ƆKS- = (-ai-) : mausMAUS, etc.,

or, in regard to the given radicals,

(-z) : (-Z) = (-s) : (-S) = (-iz) : (-IZ) = (-ən) : (-ƎN) = (-ai-) : (-AI-), etc.,

or, again in regard to the given radicals,

(-Z) : ( ) = (-S) : ( ) = (-IZ) : ( ) = (-ƎN) : ( ) = (-AI-) : (-AU-), etc., or
(-z) : triˑ- = (-z) : giv-, but (-Z) : TRIˑ- ≠ (-Z) : GIV-, and consequently
(-zZ) : triˑ-TRIˑ- ≠ (-zZ) : giv-GIV-, etc.

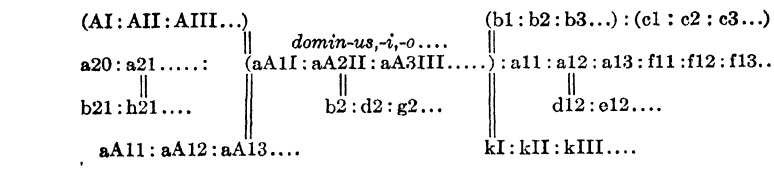
As may be seen, in all these types of contexts both the radical and the formative elements are simultaneously in-

cluded; that is what makes them more strictly systematized than finished words. A language is considerably more hospitable to words than to morphological parts. If the latter are borrowed at all, they generally forfeit their specific character or they are subjected to the systematic morphological reshaping of the borrowing language. Thus, when the Germans adopted the French word *amus-er*, it became *amüsier-en*, with an entirely different contextual grouping. What was an ending in French has become an integral part of the radical in German.

Simple and Morphological Word Systems

This suggests a distinction between two types of finished words—those which are the result of a systematic combining of still productive parts and those which are completely finished. Their relative number in a given vocabulary varies considerably from one language or linguistic period to another. These two types of finished words are contextually grouped in the system, but differently. The former enter into systematic contexts (*a*) as integral entities, (*b*) as decomposable into radical and nonradical elements, and (*c*) as decomposable into sounds; the latter only as integral entities and as decomposable into sounds. Thus, the Latin *dominus* is contextually grouped with all the other declensional forms of the word, and this contextual group as a whole or each complete entity of the group will be in a variety of contexts with other separate words or with other contextual morphological groups. The possible combinations are innumerable, and it would be a Sisyphean task to try to give an approximately true picture of the situation. Leaving its further elaboration to the imagination of the reader, we may give the following formula as an illustration of what takes place in the case of morphologically complex words:[13]

[13] It is understood that the radicals referred to here are not those which the etymologist would establish; *cf.* pages 157*ff.*



Parentheses = groups; letters = radical elements; small letters = phonetic aspect; capitals = referential aspect; figures = formative elements; Arabic figures = phonetic aspect; Roman figures = referential aspect.
a = *domin-*; A = *DOMIN-*; b = *bon-*; c = *radi-*; d = *don-*; e = *cre-*; f = *gubern-*; g = *puer-*; h = *stult-*; k = *arbor-*.
1 = *-us*; I = referential nominative; 2 = *-i*; II = referential genitive; 3 = *-o*; III = referential dative; 11 = *-are*; 12 = *-ator*; 13 = *-atio*; 20 = *-ium*; 21 = *-a*.

In this picture we have deliberately disregarded the eventual combinations with separate sounds and the expansions or contractions that either the radical or the formational elements may present. But it is clearly brought out that morphologically complex words are pretty strictly systematized, because the radical and the nonradical parts, though contextually separable, are always simultaneously present, as regards both their phonetic and their referential aspects.

As to the other type of finished words, their systematic contextual combinations may be illustrated as follows:

(1) Phonetically

[hʌt] : [(b)ʌt] : [h(æ)t] : [h(ʊd)] : [(kæ)t] : [hʌ(l)] : [hʌt(ɪŋ)] : [hʌt(ɔd)] : [hʌt(s)]. . . . . .,

in which formulation the dissimilar parts are between parentheses, and

(2) semantically the reference symbolized by [hʌt] is likewise complex and may be represented by such a formula as

$$1 + 2 + 3 + 4 + 5 \ldots .$$

On the other hand, the references of the symbols *cottage*, *house*, *bungalow*, *shelter*, may be formulated as follows:

$$1 + \text{II} + 3 + 4 + 5. \ . \ . \ .$$
$$1 + 2 + \text{III} + \text{IV} + 5. \ . \ . \ .$$
$$1 + 2 + 3 + \text{IV} + 5. \ . \ . \ . \ .$$
$$1 + 2 + \text{III} + 4 + \text{V}. \ . \ .$$

Hence we get the following referential contexts of [hʌt]:

$1 + 2 + 3 + 4 + 5. \ . \ . \ . :\ 1 + (\text{II}) + 3 + 4 + 5. \ . \ . :$
$1 + 2 + (\text{III} + \text{IV}) + 5. \ . \ . :\ 1 + 2 + 3 + (\text{IV}) + 5. \ . \ . :$
$1 + 2 + (\text{III}) + 4 + (\text{V}). \ . \ .,$

where again the dissimilar features are between parentheses.

The phonetic components of this particular example are pretty closely defined by reason of the shortness of the symbol. The longer a word symbol is, the more of its phonetic parts are apt to be left untouched by the system. Nevertheless, the isolated word is, as a rule, phonetically bounded with fair precision, because sounds are, in a sense, quantitative entities whose limits are more conspicuous. In regard to the referential aspect of the word under consideration, it should be noticed that a certain number of its features remain outside of the system and allow, therefore, of a freer handling. Although, as has been pointed out before, the isolated word is semantically defined in a certain way, its referential range can be only vaguely appraised, as with all mental abstractions. The meaning of a word is only a slow crystallization of many experiences on the part of the speakers.

Sentence Systematization

The action of the system does not stop with the word; it also extends to the sentence. From a great number of sentence experiences the mind abstracts common features and groups them. But on account of the infinite variety and complexity of countless speech experiences there are so many elements left free, and the common ones are so general and abstract, that it would be hopeless to attempt a schematic

formulation. Systematic sentence contexts are in terms of stress, pitch, rhythm, modulation, tempo, order, referential expansion, stricture, combination, etc. Hence the sentence is primarily free and is eminently the unit of speech.

Unconsciousness of Systematization

It is often objected that the systematic facts of language are mere abstractions of the grammarian and do not correspond to anything real. Surely, to claim that all these countless and complicated contexts of sounds, morphological parts, words, and sentences should be consciously present in the minds of the speakers would be more fantastic than to believe in the subsistence of universals. The systematization takes place unconsciously, and any context or part of a context emerges only when it is called for by some related contextual part or whole. Although the systematic facts of language are abstracted from speech, they are not mere abstractions but are engraphic entities.[14] The detailed phases of the process of systematization we may leave to the psychologist to explain; the fact itself is not only revealed to us by introspection, but is unequivocally manifest from general linguistic behavior. The child builds up gradually and unconsciously the system of his language, and his occasional missteps are unmistakable signs of his groping efforts. Without systematic grouping it would be impossible to combine the linguistic material in a definite way for purposes of communication. Unconsciously even the most primitive people are grammarians, and in more than one sense they are better and safer than professionals. The grammarian's task is not to systematize and to abstract, but to analyze and formulate what the speakers do. A grammar is valid only while the linguistic system with which the speakers operate remains essentially the same.

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[14] *Cf.* Pos, *op. cit.*, pp. 53*ff.*

Differentiation of Word and Sentence

At this juncture it is possible to proceed straight to our objective: How is the word differentiated from the sentence and from the morphological elements? Is their mutual relationship the same as that of a whole to its parts, or do they belong to entirely different orders?

The Word

When we utter the single word *wood*, we detach it from the unconscious systematic contexts that its phonetic and referential elements respectively form with the phonetic and

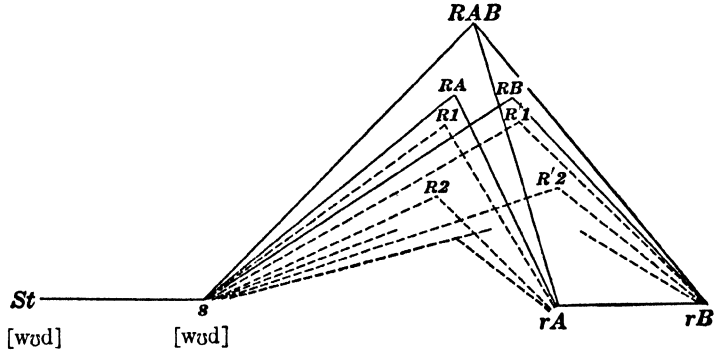

Fig. 21

St, stimulus; *s*, symbol; *R*, reference; *r*, referent.

referential elements of other words in the system. Thus consciously detached, the word appears with both its phonetic and its referential aspects contextually connected and in a way defined and limited by the system. The result may be schematically represented as in Figure 21. *St* consists of the sound combination [wʊd] which is in sign context with *s* [wʊd]. *s* symbolizes the very general, common, and complex reference *RAB* linking *s* to its two consciously related

referents *rA* and *rB*. *RAB* is decomposable into the common complex reference *RA* linking *s* to *rA* and into the common complex reference *RB* linking *s* to *rB*. *RA* and *RB* respectively are decomposable into a certain number of more simple and specified references *R1*, *R2*. . . . and *R'1*, *R'2*. . . .

The Sentence

When we utter the sentence "I break this piece of wood," the symbolization process may be pictured as in Figure 22. *St* may consist of the phonetic combination

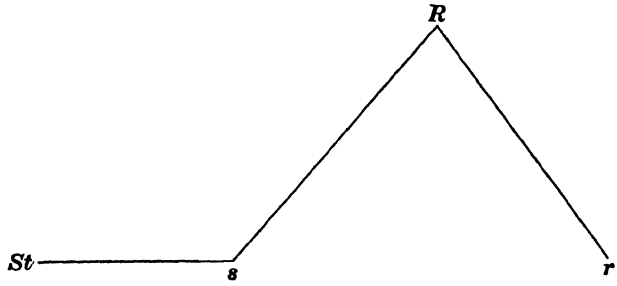

FIG. 22

St, stimulus; *s*, sentence symbol; *R*, reference; *r*, referent.

[aɪbreɪkðɪspɪsəvwʊd], which is in sign context with the corresponding *s*. The latter symbolizes the sentence reference *R* and is thus linked to its referent *r*.

Comparison between Word and Sentence

A comparison of the two processes reveals some striking differences:

1. (*a*) The word is polysemous, that is, the same symbol is simultaneously in context with a variety of common and more specific references. This does not mean that all these references are consciously present with great or equal clarity; one or more may be set off, leaving the others in the penumbra of consciousness.

(*b*) The sentence symbol has only one specified and well-located reference and, of course, only one referent. Again, this does not exclude the possibility of ambiguous sentences. But if they are so, they have to be expanded or otherwise located until they are unambiguous in all relevant respects, or they cannot serve their natural purpose of adequate expression or communication. As to intentional equivocating as well as psittacism,[15] these outgrowths of speech, however interesting from other points of view, may be ignored in this discussion of fundamentals.

(2) (*a*) In the case of the single word both the symbol and its various references are engraphically or mnemonically predetermined.[16] The voluntary aspect of the whole process is limited on the part of the speaker to the possible evocation of some part of the context which then brings forth the other parts automatically, and to the act of utterance; on the part of the listener all the phases of the process are primarily passive.

(*b*) In the case of the sentence the following phases may be voluntary on the part of the speaker: (1) the evocation of some contextual part, (2) the choice and the grouping of the various referential components, (3) the choice between a variety of possible symbols, (4) the act of utterance. On the part of the hearer the process is primarily passive.

3. (*a*) The referential contexts of the word symbol are engraphically present in all the individuals who know the language concerned whether the word is uttered or not, provided, of course, that the word belongs to their acquired vocabulary. These individual contexts may vary within certain limits as to their number, both actual and potential,

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[15] Psittacism (< Lat. *psittacus* = 'parrot') consists in talking about a subject in the absence of any actual thought or understanding. See also page 75; also L. Dugas, *Le psittacisme et la pensée symbolique, Psychologie ou Nominalisme.*

[16] *Cf.* Ammann, *op. cit.*, I, p. 15.

their clarity, their complexity, their adequacy, etc., but in their general and basic features they are alike.

(*b*) The referential context of the sentence symbol is present only in the speaker and the hearer(s).

4. (*a*) The spoken single word is exclusively or at least primarily a referential utterance.

(*b*) The sentence may be (1) a purely or primarily emotive expression or (2) a purely or primarily referential communication.

This is what we mean. The single word, as we have suggested before, never exclusively or primarily expresses an attitude (emotion, desire, etc.) of the speaker. Where it apparently does, as, for instance, in exclamations ("Oh!", "Beautiful!") or in curses ("Damn!", etc.), we really have sentences. We may, of course, detach a sound combination like *damn* or *beautiful* or *donnerwetter* from the rest of the vocabulary system, quite apart from any sentence context; but if we do so, these symbols lose their exclamatory character and become mere mnemonic and polysemous symbols for complex references. When a phonetic combination like *sacrebleu* becomes a word symbol, it does not express an attitude of the speaker. Instead of being a sign in an emotive context, it becomes a symbol whose complex reference is derived from many personal and impersonal sign contexts *sacrebleu* and whose referent is a certain attitude of any speaker. A certain emotive coloring may undoubtedly accompany the utterance of such a word, but this is decidedly a by-product. All that we utter by the single word as such is the symbol for a compound reference. Thus it is differentiated not only from an emotive expression, but also from a referential communication. Communication is positively foreign to the single word.[17] This remains true even if we assume that one person may act in a dual function, as speaker and

[17] *Cf.* A. H. Gardiner, "The Definition of the Word and the Sentence," *British Journal of Psychology*, Vol. 12 (1922), pp. 352*ff.*

as listener. If we really communicate a word to ourselves as if we were the hearer(s), this word becomes a sentence, which when expanded would be something like this: "The word symbol for the complex reference 'house' is [haʊs]." Such a phonetic expansion is obviously not needed here, because the sentence context is largely expressed by the situation known to us. The fact that we always hear or that others may hear the word we utter is merely an accidental circumstance. It is not the function of the single word to be communicated or to communicate.

The Word Not a Mere Sum of Sentences

From a hasty interpretation of Figures 21 and 22 it might be concluded that the single word is really nothing else but the sum of a certain number of sentences. As a matter of fact, each word symbol can become the subject of a number of sentences in each of which one of the more general or more special references symbolized by the single word symbol is the predicate—for instance, "Wood is a material," "Wood for building purposes is called timber," "A wood is a collection of trees," etc. But in the first place, in each of these sentences the reference of the symbol [wʊd] is specified by the sentence context, whereas in the single word *wood* no such specification takes place. Secondly, the single word symbol is in context with more than a mere sum of references; all the possible special references symbolized by the symbol have certain common features, however general, which represent the abstracted common reference of the word (*RAB* of Fig. 21). Whenever the symbol is connected with a specified reference in a sentence context, this reference is felt to be related in some way to the generalized common reference of the single word symbol. In actual reality every new specification of a word reference in a sentence results in a gradual transformation of the common abstracted reference, but psychologically the latter is static in the same way as the

human body is a constant unit in spite of its biological changes. It is very difficult to define such a generalized common reference, but such difficulty is inherent in all definitions. It by no means follows that the object of the definition sought is less psychologically real.[18] But even if we should succeed in defining it, we could do so only in a sentence—for instance, "The generalized reference of the word symbol [wʊd] is *x*." The reference of this sentence would not be the same, however, as that of the single word symbol [wʊd] itself, which is *x*. The sentence reference would be a relation of correspondence between word symbol and word reference; the sentence referent would be the semanto-phonetic word *wood*. The referents of the single word are the material (wood) and a collection of trees.

Word and Sentence Essentially Distinct

We can now see how apparently close to one another the sentence and the word may come to be, while actually they are just as removed from each other as the two poles of the earth. In the same respect a word is never a sentence and a sentence is never a word. The simultaneous presence of irreconcilable aspects in the same quantitative data is only superficially paradoxical. The same individual may at the same time be father and son, although the aspects of fatherhood and offspring are diametrically opposed. But if we wish to characterize the son *qua* son, we must do so indipendently of his fatherhood. The latter may come in only by way of antithetical and negative element of external demarcation, not as a positive element of referential definition.

"Sentence Words"

The expression "sentence word" in our conventional linguistic terminology is, therefore, a particularly unfortunate

[18] We do not consider that a specified sentence reference is necessary for a "symbol context." See Ogden and Richards, *op. cit.*, p. 104.

one and should be discarded. In linguistic science it is, at least as a dvandva compound,[19] just as sterile and misleading as the expression "father-son" would be in anthropology. It is surprising that some inventive linguistic engineer has not yet thought of endowing our young science with such hybrids as "sentence syllable" and "sentence sound."

The Word within the Sentence

However, the term "sentence word" could be made useful by having it refer to the "word within the sentence." As such it would form a most convenient contrast to such symbols as "single word" or "isolated word" or "system word." The question what becomes of the word when utilized as part of the material of the sentence is a very interesting one, and pursuit of the inquiry is able to throw more light upon the nature of the word. That we "use" words in speech is beyond doubt, in spite of the fact that the sentence is the real and primary unit of speech and that we do not form sentences by merely juxtaposing words. As suggested before, the primitive word has developed from the speech sentence;[20] once it had been recognized as a recurrent contextual entity, however, it was not only used in similar, though different, speech contexts, but it soon also became the object of extra-speech combinations. Let us again resort to a schematic picture. The sentence "I have not seen her" as pronounced in current speech may be represented as in Figure 23. The phonetic symbol consists of a combination of sounds flowing into each other so that we can distinguish only certain outstanding elements, which correspond to the phonetic letters in our picture. This sound combination is

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[19] A dvandva compound is one in which the relationship between the two constituents may be rendered by the conjunction *and*; for example, *prince-consort*. See page 138.

[20] *Cf.* Jan van Rozwadowski, *Wortbildung und Wortbedeutung*, p. 58; Wilhelm M. Wundt, *Völkerpsychologie*: *Die Sprache*, I[4], pp. 609*ff.*

presented as one unit. Its unity is derived from the unity of the situated reference and of the referent and is phonetically expressed by accent, modulation, rhythm. From the point of view of sonority we can distinguish four waves whose crests are on [a], [ə], [i], [ə]. From the point of view of stress we find two groups, the first of which is ['aɪvənt] and the second ['si·nə].

What has happened? The word material supplied by the system to the sentence has been curiously crippled. It has been absorbed and thoroughly welded together, so that the

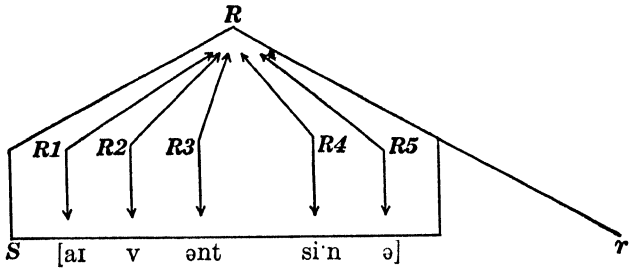

FIG. 23

S, phonetic sentence-symbol; *R*, sentence-reference; *R1–R5*, component references phonetically symbolized; *r*. sentence-referent.

word boundaries are completely wiped out. They can only be approximately ascertained by resorting to the system for comparison. Of the words [hæv] and [hə·] all that is left is [v] and [ə]. The word [nɔt] has been changed into [ənt]. And yet the sentence symbol is perfectly adequate. Its reference does not need for its symbolization all the richness of the systematic symbols. This absorption of the word by the sentence may, of course, be more or less complete, but it is a characteristic feature of the spoken sentence.[21]

An examination of the referential part of the sentence

[21] *Cf.* Ottomar Dittrich, *Grundzüge der Sprachpsychologie*, I, § 92 C.

reveals a similar condition. Of the various references of each isolated word the sentence has picked out and adapted one suitable for the purpose, while all the others are temporarily cancelled. By a process of metaphorical abstraction this reference might even assume a very personal and unique character. The specified single word references are brought into connection of subordination, coördination, definition, etc., with each other and with the general and more specific situation, so that the result is one unambiguous sentence reference.

If now we compare the referential components with the phonetic divisions of the sentence symbol, we find that they do not at all correspond to one another. Neither the sounds nor the syllables nor the stress groups symbolize any particular reference. There can be a question of correspondence only between symbol and reference, if we consider the sentence as a whole. Not only has the sentence whimsically utilized and absorbed the referential and phonetic parts of the single words, but the unity of the latter has been literally destroyed. Reference and symbol have been torn apart, so that there is no trace left of a word "unit" within the sentence. If we look for the word within the sentence, we must be prepared to find perhaps no more than relatively identifiable débris which can be put together and expanded only with the help of the system.

This shows how utterly impossible it is to define the single word as long as we look for it within the sentence.[22] All the mental subtleties that have been mobilized to arrive at a formula on such a basis have been futile and without success. The single word is a systematic unit and the word within the sentence can only mean the word material used by the sentence in its own characteristic way. It is of no direct concern to the single word how far the speech sentence goes in

[22] *Cf.* Dittrich, *Die Probleme der Sprachpsychologie*, p. 111.

the stretching, constricting, dismantling, and absorbing of its systematic word material. That in German the morphological single word *stattfinden* is sometimes phonetically torn apart in the sentence by no means destroys its systematic unity as it is undoubtedly felt by the German-speaking community. If, as Jespersen wants it,[23] this separation of the two word components in the sentence were a criterion of word duality, we might with the same right maintain that *not* is not a word at all in English. For in the spoken sentence it is sometimes entirely swallowed up by a neighboring sound, as, for instance, in the sentence "I don't want to", which is often pronounced [aɪdõwɔ·ntu].[24] Indirectly, of course, the behavior of the sentence affects the system words inasmuch as speech provides the material for systematic abstraction and grouping. But, as a rule, that which is abstracted and systematized, namely, the single word, is not the result of one or a few specific speech experiences but of many and very diverse ones.

Number of Words in the Sentence

Hence the general answer to the general question how many words are used in a sentence is easily given. There are as many as in the light of the word system of the language concerned can be put together with the phonetic and semantic débris gathered from the sentence. In order to apply this principle it is no doubt necessary to be thoroughly familiar with the systematic and speech functions of the particular language. It takes little daring to defy anybody to ascertain the number of words used in a sentence of a language whose system is entirely unknown to him, even after a literal translation of the sentence has been given him. In order to be in some measure successful he would need a large number of other sentences so that from their common parts he might

[23] *Cf.* Otto Jespersen, *The Philosophy of Grammar*, p. 95.
[24] *Cf.* page 34 and the speech curve on page 60.

himself be able to abstract the linguistic system. Even knowledge of the latter does not always enable us to point out the words in an empirically given sentence. But in this there is nothing disturbing or surprising. If it is true that owing to the system a language remains sufficiently itself to be felt as a stable form by the speaking community at a given time, it is no less true that owing to speech it evolves more or less slowly but steadily. The abstracting of data from a large number of experiences, their grouping and systematizing among data already mnemonically embedded in systematic contexts, is a process which is continuously operative in the speakers' minds. A very long time is often required for a free syntactical combination to become a compound word, for the compound to become a morphological word, and for the latter to become a simple word.[25] Besides, the free compounding of already systematized words, both phonetically and semantically, is a most convenient and frequent means of creating shorthand terms, momentary and purely individual speech products, of which only a limited number become generally systematized. In speech, then, we are bound to find components whose process of systematization is not sufficiently advanced to allow of any clear-cut classification. This is not due to a defect in the definition of the various systematic units, for instance, of the word, but to the evolutionary character of language.

If we are asked how many and what words are used in a sentence like [aɪdõwɔ·ntu], we shall point out five, namely [aɪ], [du], [nɔt], [wɔ·nt], [tu]. But manifestly that is not what we actually have in the spoken sentence. Such a decomposed sentence and its words are purely artificial, because we make the semantic part of each word artificially correspond to a phonetic symbol. We may occasionally speak something that sounds very much like it, as, for

[25] *Cf.* pages 132*ff.*

instance, when for some reason or other we wish to emphasize each word. As such, however, these words never occur in the system, because although phonetically they may agree with the systematic word, semantically they are determined by the sentence; neither do they, as a rule, occur in the spoken sentence, because in the latter their unity is broken and torn asunder. Besides, this very decomposition is made possible only by resorting to the system. What we really do when we thus separate the words of a sentence amounts to a temporary and methodological abstraction by means of which speech and system may be compared and tested reciprocally. To define the word on the basis of such artificial entities would result in multiplying the number of words *ad infinitum*. For, on the one hand, each of such words has a meaning specified by the sentence context which would be different from one sentence to another; on the other hand, a word like Fr. *mois* in the sentence "Je le vis un mois après" would not be called the same word as that of the sentence "Il y a deux mois que je ne l'ai vu," because of their phonetic difference ([mwaz] and [mwa]). That the spelling of a language is no safe guide should be sufficiently realized today after all we know about the relationship of written and spoken language.

Words and Derivational Parts

But what about the difference between radical and formative [26] elements on the one hand and words on the other? Surely they all are systematic entities; but whereas the word can be turned into sentence material without any further systematic construction, the radical and formative elements as such are previously subjected to a systematic structure. Again acquaintance with the linguistic system and its mechanism is a prerequisite for the distinct separation of

[26] *Cf.* page 146.

finished words and of morphological parts from the sentence. This is no vicious circle, because even where in a sentence a morphological word is used that we have never heard before, we are able to recognize it as such. Any English-speaking person who hears for the first time a sentence like "I have been skiing" knows that *ski-* is here used as a radical and *-ing* as a formational element. Similarly, when I heard for the first time the sentence [aɪdõwɔ·ntu], I never thought of considering the nasalization and peculiar timbre of [o] as a morphological element of the conjugational system of the verb. Nor is it a safe criterion that a certain sound combination may or may not occupy different positions with respect to other combinations within the sentence.[27] The inference drawn in this manner may often be correct, but not always. Thus, the fact that the English article may be separated by one or more other words from the word it determines is in itself not sufficient to establish its identity as a word. On that account the English genitive element *-'s* would be a word, for it is occasionally separated from its noun (compare the expressions "William of Orange's reign," "that man over there's coat"). Furthermore, the application of such an external criterion would meet with innumerable difficulties in the case of so-called incorporating languages.

Varieties of the Same Word

We can now examine in what sense one word may be said to be a variety of another. The whole matter is one of systematic grouping. Since the supposition is that there are common elements bound to differentiating ones, the feeling of absolute word difference or relative identity will depend chiefly upon the relative closeness or aloofness that is felt to exist between the various differentiating elements with regard

[27] *Cf.* Jespersen, *Language*, pp. 423*ff.*

to the common one. In this respect conditions may not be the same in different types of languages, so that it is impossible to arrive at any definite conclusions of universal applicability. The following analysis is based upon the conditions prevailing in our Indo-European languages. In order to deal with this problem, however, we must separate two distinct types of cases: (1) where the difference is neither a morphological nor a categorial one;[28] (2) where the difference is either morphological, or categorial, or a combination of the two.

1. In the first case the difference may be one of sounds, or of reference, or of both. (*a*) If we assume that two exact synonyms do not occur, then a purely phonetic difference can never result in word differentiation; thus, Fr. [mwa] and [mwaz] (*month*) are varieties of one another. If we disregard minor semantic shades so that we believe in synonyms, a purely phonetic difference does not entail a difference of words if the two sound combinations are felt to be closely related; again, Fr. [mwa] and [mwaz] (*month*). If the two phonetic forms are not felt to be closely related, we have two synonymous but different words; thus, *heaven* and *sky*.

(*b*) Within the same category a semantic difference with identical sounds entails a difference of words if the process by which one reference has been substituted for another is no longer felt by the speaking community in general. Otherwise they are varieties of one another or even the same word. Thus, Engl. *top*, 'highest part,' and *top*, 'a toy,' are two words, whereas Germ. *Himmel*, 'heaven,' and *Himmel*, 'sky,' are said to be the same.

(*c*) Where both the reference and the sounds present partial differences, we shall *a fortiori* have different words if either the semantic or the phonetic differences, singly or combined, are such that they would entail word differentia-

[28] *Cf.* pages 186*ff*.

tion on the grounds given under (*a*) and (*b*). Thus, Germ. *schlecht* and *schlicht* are two different words, although phonetically they may be felt to be closely related.

2. In the second case we must distinguish between a mere categorial difference and a semanto-phonetic morphological one. (*a*) If there is merely a semantic difference of category, the question of differentiation or relative identification becomes very delicate, because the feeling of relative aloofness or closeness of the two categories may fluctuate in the language concerned. Thus, in English the adjective is felt to be categorially close to the noun, in German the adjective to the adverb, so that Engl. *stone* (noun) and *stone* (adjective) or Germ. *schlecht* (adjective) and *schlecht* (adverb) may be considered varieties of each other or even the same words. The aloofness of noun from verb is more pronounced, so that *act* (noun) and *act* (verb) might be more strictly kept apart. However, there seems to be a great deal of hesitation, with a tendency to relative identification. But if a phonetic difference is found to complicate the situation, as, for instance, in English [haʊs] (noun) and [haʊz] (verb), this tendency loses much of its strength.

(*b*) A morphological difference in the technical sense of the word is, of course, always semanto-phonetic. It may happen that one of the two morphological parts (that is, the radical or the nonradical element) is the same or that both are different. If there are two different radicals with identical nonradical elements, we speak of two different words; for instance, *hand-s* and *arm-s*. If the same radical is expanded by two different nonradical elements, the absolute differentiation or relative identification again depends upon the relative aloofness or closeness between the differentiating parts. In English, German, and French a difference of gender, number, comparative degree, conjugational or declensional form is generally thought to be slight enough to allow of relative identification. Other differences of categorial or

noncategorial meaning are generally felt to entail word differentiation; thus, in English, *love, lovely, loveliness; (to) fall, (to) fell; yellow, yellowish;* or in German, *können, kennen; hoch, Höhe, Hoheit; kommen, bekommen; Furcht, furchtbar, furchtsam;* or in French, *travailler, travailleur,* etc. If both the radical and the nonradical elements are different, the relative semantic identity may occasionally be felt so strongly that relative word identification is the result. Thus the various conjugational forms of *to be* might be said to be varieties of one another. As a rule, however, the feeling of differentiation will prevail.

Summary of Requirements for Sentences and Words

Without attempting to give any formal definitions we may sum up our discussion by pointing out such factors as may be inferred to be relevant or irrelevant to the sentenee and the word.

For the sentence, some articulate sound or sounds are necessary; their number or character is immaterial, provided there is one; they are determined partly by external circumstances, inasmuch as they are utilized systematic symbols grouped according to the prevailing system of sentence structure, and partly by free choice, inasmuch as we may choose from a variety of symbols and structures and run them together to a degree suitable for the purpose; each systematic word symbol utilized must be present at least in the form of a sound element; the sound or sound combination may be in a momentary sign context with the speaker's attitude and uttered either for the purpose of mere self-expression or simultaneously also of communication; the semanto-phonetic unit so obtained must be capable of producing a similar attitude in a suitable interpreter; or the sound or sound combination may be in a momentary symbol context with a specified reference and uttered for the purpose of communication; the semanto-phonetic unit so obtained

must be capable of causing a suitable interpreter to make the same reference in all relevant respects.

For the word, some articulate sound or sounds are required; their number and character are immaterial, provided there is one; they are predetermined by external circumstances, historical and systematic; they are systematically grouped as a unit; they are in a mnemonically predetermined symbol context with a complex reference or consciously interrelated references likewise systematically grouped and relatively determined; this semanto-phonetic unit is in its basic features common to all the speakers of the same language, provided it is part of their vocabulary; possible complications with sign contexts are immaterial; this unit is ready to become sentence material without needing any further systematic structure or allowing of any decomposition into other such units; the use made of it by the sentence is immaterial, provided a phonetic element is left whose corresponding specified reference is traced to the systematic word reference; both self-expression and communication are foreign to the word.

On this basis it is possible to define (*a*) the *simple word* as a word which is felt by the speaking community not to be decomposable into or synthetically resulting from minor semanto-phonetic parts; (*b*) the *morphological word* as a word which is felt by the speaking community to result from a combination of two minor semanto-phonetic parts at least one of which cannot become sentence material without further systematic structure; (*c*) the *compound word*, if primary, as a word felt by the speaking community to result from a combination of two simple or morphological words whose phonetic elements are united according to a systematic pattern and each of whose referential contexts appropriates part of the other.

For the word within the sentence, some sound, sound combination, or sound element (nasalization, accent, timbre, etc.) is required; the character or number of these features

is immaterial; they are determined partly by the systematic word, partly by the degree of absorption and adaptation in the sentence; they are in a momentary sign or symbol context with a semantic part of the sentence, but as such they form no unit; their emotive or referential meaning as well as their phonetic part is found in some corresponding systematic word context or is felt by the speaking community to be traceable to some such context.

The Dictionary Word

Finally, we may note that the word as described above is clearly distinguished from the *dictionary word.*[29] The dictionary, it is true, gives the main referential contexts of a word; but because its classification is founded exclusively upon the arbitrary principle of alphabetical order, its words may also include such references as are felt by the speaking community to be part of entirely separate word contexts (for example, *ball,* 'round object,' and *ball,* 'entertainment of dancing'). Besides, hardly anything of the systematic phonetic grouping is indicated. To give a somewhat faithful picture of the system word the dictionary would have to group words together in clusters showing the many-sided phonetic and semantic contexts of each word.

The Formula and the Compound

Formula and Compound Defined

In contrasting the following sentences: "He left him a fortune," "He left him at home," and "He left him in the lurch," we feel at once that in the first two the relation between *left* and the object nouns is very loose. The references symbolized by *fortune* and *at home* would be changed only little if we said "He gave him a fortune" or "He saw him at home" or if we used a great many other sentence contexts.

[29] *Cf.* Albert Dauzat, *La philosophie du langage,* pp. 214–15.

But in the third sentence the meaning of *lurch* is essentially dependent upon its being connected with the verb *to leave*, which could not be replaced by any other verb. As an independent synonym of 'discomfiture'[30] the word *lurch* is entirely obsolete, but it still has some such meaning in the current expression "to leave in the lurch," of which all the components are felt to belong together. A phrase that is thus interpreted as a stereotype unit consisting of words which cannot be arbitrarily replaced without destroying the meaning of the unit and its parts is called a *formula* or a *formular expression*. It illustrates one of the first stages of abstraction and isolation from speech. Its components have been so often used in phonetic and semantic connection with one another that they are isolated as a complex unit. Nearest to the formula in the language system is the *compound word*, the difference being that here the process of unification is more advanced. Both are felt as phonetically decomposable into separate words each of which is embedded in systematic contexts; semantically they are felt to be decomposable into several word references specified by the formula or the composition as units. But the feeling of complexity is more distinct, that of unity is less final, in the formula than in the compound word. If conditions are favorable, the parts of the formula will eventually become amalgamated into a single word, at first perhaps compound, then morphological, and at last simple. The more the phonetic parts are looked upon as an unanalyzable whole and the more the specified component word references are lost within the general reference of the complete formula, the more distinctly the latter will be systematized as a single word.

[30] *Cf.* Thomas Lodge, *An Alarum against Usurers* (1584), Reprint for the Shakespeare Society, Vol. 45 (1853), p. 54: "If heereafter thou fall into the lyke lurch. . . so then I will accompt of thee as a reprobate." The phrase "to leave in the lurch" was derived from its use in an old game; "to lurch" is still used in playing cribbage. See W. W. Skeat, *Etymological Dictionary of the English Language.*

A formula may be used in the function of a complete sentence. The unity of the phrase "How do you do?" as a mode of approach or a greeting is derived not only from its being a sentence, but also from the stereotype fashion in which its constituent parts are interrelated. Nothing in it could be replaced by something else, nothing could be added to it or taken from it, without completely upsetting the mutual relationship of the parts and the meaning of the whole. Taken as it is, it is in an immediate sign context with a certain attitude of the speaker to the hearer. It has practically no referential value at all. If we substituted *what* for *how* or *work* for the second *do*, or if we said "How do you do that?", the sign context would disappear and give way to a symbol context with referential meaning. Occasionally, no doubt, the sentence "How do you do?" may be used referentially. As a question put to a patient it may actually mean what its constituent symbols symbolize; but as a mere greeting formula it symbolizes no reference whatsoever and is not even supposed to be a question. The reaction on the part of the hearer may be just a repetition of the same formula. Because it itself is a sentence, not merely sentence material, it may be termed a *sentence formula* or a *formular sentence.*

Gradation from Free Construction to Simple Word

As already suggested, there is only a gradual difference between the formula and the compound word. In the latter the systematization is so advanced that the components are interpreted as systematically united, both semantically and phonetically, and as forming a single word; with the former the feeling is that the formular unit consists of components which not only are separable as individual words, but whose individuality is still preserved within the formula. In many cases it is practically impossible to distinguish between the two, where the feeling in one direction or the other has not

become sufficiently stabilized and generalized among the speakers.

An illustration of the scale of systematization can be given as follows. Leaving the word order out of consideration, there is nothing at all formular in the expression "to break a piece of wood." Referentially each word is replaceable without any serious disturbances in the references of the other words. The reference of *wood* is basically the same whether occurring in "This table is made of wood" or in "I burn a piece of wood;" the reference of *piece* and of *break* would be hardly changed if we said "I break a piece of bread." But on hearing the expression "to break bread" we immediately realize that we are in the presence of a compound symbol whose technical reference is a unit and that its components cannot be interfered with without destroying the unity of this technical meaning. If we say "to eat bread" or "to break cake," we obtain free expression of the same type as "to break a piece of wood." Yet the formula "to break bread" is not interpreted as a compound word. Its unification is only relative, not final. Not only is it possible to use it in the absence of any technical reference, but even when it occurs in a formular function, its components are still looked upon as separate words. A closer kinship with final composition is possessed by the expression "to break in" as applied to a shoe, a new car, etc.; in the consciousness of the speaking community it hovers between the formula and the single compound. But when we speak of a "nervous breakdown," we all agree in dubbing *breakdown* a single word, although compounded of two constituents which are distinctly felt as separable word units. Finally, that *breakfast* is not even thought of as a composition is clearly indicated in the conjugational treatment of the verb[31]—"he breakfasts" instead of "breaks fast," or "breakfasted"

[31] *Cf.* page 290.

instead of "broke fast." It is a word whose systematic unification has reached the point where its components are no longer felt as separable units; it is today a simple word.

Syntactical and Analogical Compounds

Of the above illustrations it may be said that they all are syntactical fragments of sentences from which they may have been isolated as free expressions, formulas, compounds, and simple words. Originally the development of the word has probably taken the course of such progressive isolation of speech fragments. But once a certain number of compounds had thus been formed, they could serve as models for the creation of similar ones outside of speech. Words like *week-end, crosspatch, firework, typewriter,* and countless others were put together by a systematic composition after established patterns. It is worth noting also that a foreign compound introduced and incorporated ready-made into a language is likely to forfeit its compound character unless the two languages are so closely akin that the composition remains obvious to the borrowers. O. Fr. *avant-pie* (*pied*) became M. E. *vampey,* which could hardly be interpreted as a compound. Its shrinkage to Mod. E. *vamp* could not have come about if awareness of the structure of the word had survived in the English surroundings.

Criteria of Composition

Although spelling may result in a quicker or slower feeling of word unification among people who write and read a great deal, it is not an absolute criterion for discrimination between formulas and compounds. English formations like *fire extinguisher, insurance company, son-in-law,* etc., are scarcely different in character from their German counterparts *Feuerlöscher, Versicherungsgesellschaft, Schwiegersohn.*[32]

[32] Compare the following English unit of signification: "Rexall milk of magnesia tooth paste."

However, it must be admitted that the tendency toward systematic composition is more active in German than in English. The unity of many German compounds is more keenly experienced than that of the corresponding English ones. On the other hand, the feeling of unification often finds a more reliable expression in some characteristic feature of the sound symbol, which may then act as a criterion of composition. The most pervasive of these features is the accent. Free combinations like *main land, some thing, loud speaker* are clearly distinguished through accentual differences from their corresponding compounds *mainland, something, loudspeaker.* In the wake of these modifications of accent there usually follow phonetic changes which eventually may lead to the obliteration of the feeling of composition. The vocalic part of so-called unaccented syllables is very apt to forfeit much of the distinctness of its timbre and is, therefore, considerably exposed to further changes or even to disappearance. In Modern English the word *husband* is no longer considered a compound, although in Anglo-Saxon and Middle English it decidedly was (A.-S. *husbonda* = 'master of the house'; M. E. *hosbonde, husbonde* = 'master of the house or family'). Yet its second component has not quite disappeared from the Modern English vocabulary. *Bond,* though archaic, is still used as a synonym of 'vassal' or 'serf' and as an adjective with the meaning of 'in a state of servitude.' But the relationship between this separate word and the second constituent of *husband* is no longer alive so far as the average speaker is concerned. In familiar speech *something* is occasionally pronounced [sʌm$^{?}$m̩], and this assimilation of *thing* by the preceding [m] sound could not possibly take place if reduction of stress had not previously affected the timbre of the vowel. Furthermore, it sometimes happens that compounds which were formed and had become systematized in a period when the pronunciation of one or both components

was different from what it is today have been transmitted with their former pronunciation. If then the speaking community is still aware of the relationship between the element of composition and the corresponding individual word, the character of the compound as a linguistic phenomenon is obviously maintained. The English word *vine* is preserved in the compound *vineyard* (M. E. *vynegerde*) but with an approximation to the Middle English pronunciation; however, consciousness of the connection between *vine* as an isolated word and as part of the composition has not been obliterated. The same statement could hardly be made in regard to the French word *vinaigre*: only students of language will realize the identity of its first element with the Modern French word *vin*.

Difference between Compounds and Derivations

It is not uncommon that such archaic parts of words entirely lose their former significance or completely drop out of circulation as independent word units. Perhaps, fossil-like, they just linger sporadically as historical relics in a few stray words which are then interpreted as simple (for example, *husband*). Quite frequently, however, they are utilized on a more or less extensive scale for systematic word formation. Such elements are known by the name of affixes,[33] and words of which they form part are termed *derivations* or *morphological words* instead of "compounds." The Modern English suffix *-ly* was originally the noun *līc*, that is, 'body,' 'appearance.' Although it persists today in the form of *like* (adjective, preposition, noun, verb) with the basic meaning of 'having the same appearance', the relationship between *-ly* and *like* is known only to etymologists. In Modern English it is used as a systematic means in the formation of adverbs, that is, of derivational words, not of compounds.

[33] *Cf.* page 149.

For practical purposes the difference between derivatives and compounds is just as gradual as that between compounds and formulas. It is not always possible to decide whether a component of a complex word is felt to be identified with a corresponding independent word or not. Although the relationship between the adjective *full* and the last element of *beautiful, plentiful, dreadful, mournful* is still to some degree realized, yet the meaning of this element has become so diversified as a result of its being affixed under such different circumstances that the feeling of its relative identity with the separate word *full* has been considerably weakened.

Types of Compounds

If we were to attempt to enumerate and catalogue all the various types of compounds that exist or may exist in language, there would be no end of it. Their variety is so bewildering that it seems beyond the limits of possibility to devise an adequate set of rubrications. Only the most important types can be mentioned here. One principle of classification is the manner in which the two components are phonetically joined. On this basis we distinguish composition by mere juxtaposition, that which is marked by the insertion of some connecting sound or sounds, and that which is accompanied by some internal change affecting one or both of the components. The parts that are merely juxtaposed may be two complete words, or one or both of them may be radicals of independently existing units. Compare Engl. *workman;* Germ. *Gartenzaun,* 'garden fence', *Lebzeit,* 'lifetime' (*leb-* the radical of *leben*), *Nashorn,* 'rhinoceros' (*Nas* = a pruned form of *Nase*). As to the connecting sounds inserted between the two parts, they may coincide with some flectional ending current in the language concerned, or they may be merely euphonic or analogical insertions. Compare the German words *Lebenskraft,* 'vital strength' (*-s* = a genitive ending), *Narbenbildung,* 'formation of a scar' (*-n* is today a mere

connecting sound), *Narrenstreich*, 'foolish trick' (*-en* = a genitive ending), *Narrenspossen*, 'buffoonery' (*-s* = a mere connective sound), *Kinderpuppe*, 'child's doll' (*-er* = phonetically the plural ending), *Hochzeit*, 'wedding' (*Hoch* has an open short [ɔ] instead of the long closed [o·] of *hoch*), *Hochzeitsanzug*, 'wedding suit' (*-s* = genitive ending); or English *to dum(b)found* (< *dumb* + *confound*); or Iroquois [kariwano·rõ], 'valuable thing' ([kariwa] = 'thing,' [kano·rõ] = 'valuable').[34]

From the point of view of the syntactical relationship between the two components we shall have:

1. *Tautological compounds*, which are simply a juxtaposition of two synonyms. Examples: Engl. *reindeer* (*rein* is a Scandinavian word which by itself means 'reindeer'); Germ. *Walfisch*, 'whale' (O.H.G. *wal* means already 'whale').

2. *Copulative* or *dvandva* compounds, in which the relationship between the constituents may be rendered by the conjunction *and*. Examples: Engl. *prince-consort*; Germ. *taubstumm*, 'deaf and dumb', *Prinzgemahl*, 'prince-consort'; Fr. *prince-évêque*, 'prince-bishop.' Here also belong such *alliterative* compounds as *flip-flap*, etc.

3. *Possessive compounds*, in which one element expresses a quality possessed by the other. Examples: Engl. *redskin*, *redcoat*, *bluebeard*, *blueberry*, *dumbwaiter*, etc.

4. *Determinative compounds*, in which one component plays the part of a genitive or some objective case with respect to the other. Examples: Engl. *killjoy* (*joy* = direct object of *kill*), *pastime*, *gate tower* (*gate* = genitive function), *icebound* (*ice* = indirect object of *bound*). The semantic relationship between the two constituent parts offers an infinite variety which defies all attempts at classification. Compare the English words *lovesick* ('sick with love'), *love-*

[34] In this and all our future illustrations of Iroquois forms and words we refer to the variety of Iroquois of the Caughnawaga Reservation, near Montreal, Canada. Our spelling is phonetic.

worthy ('worthy of love'), *love feast* ('banquet in token of love'), *love potion* ('a drink intended to excite love'), etc.[35]

5. *Intensive compounds*, in which the meaning of one component is intensified by the other. Examples: Germ. *eiskalt*, 'cold as ice,' *steinreich*, 'enormously rich', etc.

6. *Derivational compounds*, in which some type of derivation accompanies the composition. These are really compounds and derivatives at the same time and occupy, therefore, an intermediate position between the two. In Iroquois, for example, the radicals of nouns are frequently used in composition with some flectional form of the verb. Thus, Iroq. [kõnis] = 'I make', [kanõsa] = 'house', hence [kenõsõnis] = 'I make a house'; similarly, Du. *likken* = 'to lick', *baard* = 'beard', hence *likkebaarden* = 'to smack one's lips' (*baarden* does not exist); Du. *reiken* = 'to reach', *hals* = 'neck', hence *reikhalzen* = 'to hanker (after)' (*reikhals* does not exist); Germ. *hart* = 'hard', *Nacken* = 'neck', hence *hartnäckig* = 'obstinate' (neither *Hartnack* nor *näckig* exist independently); Engl. *first nighters* ('those who go to first nights at theatres'), *old timers*, *Free Stater*, *New Englander*, etc.

Composition in Different Languages

Not all languages make use of the process of composition. Greenlandic, for instance, a highly synthetic language, builds up words of the greatest complexity but only by means of one radical element combined with a great variety and number of affixes.[36] The power of compounding is greater in German and Dutch than in English; in English it is greater than in French. The same discrepancy prevails in regard to the kinds of words that can be compounded. Some languages can apply the process to almost any kind; in others it is limited to certain types. The possibilities are numerous:

[35] *Cf.* Michel Bréal, *Les idées latentes du langage.*
[36] *Cf.* page 331.

there may be combinations of noun with noun, noun with adjective, noun with verb, verb with noun, verb with verb, adverb with verb, etc. In Iroquois the only possible types are noun with verb and noun with adjective; a combination like *water tower* is beyond the compounding power of this language. Also, as far as the order of composition is concerned, each language follows typical habits of its own. In English it is usually the first component that qualifies the second. With us words like *knight-errant, Governor-General, bride-elect*, etc., are exceptional, while in other languages they represent either the exclusive or an equally important type.

Compounds Always Binary

A compound is always binary, being the result of and decomposable into two elements. If these elements are both simple words or radicals, as with Germ. *Apfelbaum*, 'apple tree', the composition is called *primary*; if one element is already compound, as the Germ. *Apfelbaumstamm*, 'the stem of an apple tree' (the first component *Apfelbaum* consists of *Apfel* + *Baum*), its further composition is called *secondary*, etc.

The Derivational or Morphological Word

One Nonradical Component Essential

We have defined the morphological word as one which is felt by the speaking community to result from a combination of two minor semanto-phonetic parts at least one of which is not a radical and cannot become sentence material without further systematic structure. In this way it is distinguished, theoretically at least, both from the compound and from the simple word, but practically the boundary line between the three classes cannot be clearly drawn because of the evolutionary character of language. Among the compounds, too,

there are many of which one or both components cannot become sentence material without preliminary changes. If these changes result from a mere phonetic trimming, there can be no question of semanto-phonetic structure. Thus, of the German word *Nashorn* ('rhinoceros') *horn* is complete as a word symbol whereas *nas-* has to be expanded to *Nase* in order to be so. This expansion is not semantic. Likewise in *Narrenspossen* ('buffoonery') the [s] between the two parts is no more than a meaningless connecting sound. The component symbol *narren* needs a previous phonetic pruning if it is to be detached as the corresponding isolated word. Again, this pruning is not semantic. On the other hand, if we consider the second part of a word like *farm-er*, we find that it requires more than phonetic trimming in order to become ready for use in speech. It is a sound combination which is both semantically and phonetically in systematic context with a more or less numerous set of other semanto-phonetic elements. In order to become an integral word it has to be united with one of such elements in agreement with a standardized pattern. Without such structure it is not only phonetically incomplete, but it essentially calls for a semantic process of combination. However, this condition by itself is not sufficient to characterize a word as morphological. In the German word *Schwindsucht* ('tuberculosis'), for example, the first element *schwind* cannot act as a finished word unless it is expanded both semantically and phonetically. The explanation is that in German the verb is essentially a synthetic product. *Schwind* as such does not exist; it calls for some functional expansion in order to be a finished word. Yet the word *Schwindsucht* is a compound and not what we have termed a derivational word, because whenever its first element is expanded semanto-phonetically, it plays the part of a radical in the resulting combination. If, then, a word is to be classified as derivational, it is necessary that at least one of its semanto-phonetic parts be not a radical.

Neither Phonetic nor Conceptual Criteria Available

From a purely phonetic point of view it is impossible to distinguish between the radical and the nonradical element. The sounds of a phonetic combination are no doubt contrasted, subordinated, or coördinated to one another, but such organization is purely phonetic and subject to rhythmical laws. Although a nonradical element is likely to be less accented than a radical, the latter often contains unaccented syllables. In the English word *orderly* the second syllable is certainly not more stressed than the last. In many instances the nonradical part has a secondary or even the main accent; compare the accentuation of the English words *dictate, dictator, dictatorial.* In French the accent is normally final, irrespective of the character of the last syllable; words like *enchanteur, enchanteresse, chantons* have the main stress on the suffix or the ending. Nor is the relative position of a sound combination in a word *a priori* of any significance in this respect. Nonradical parts are found at the beginning, in the middle, or at the end of the word. If accent or position are to distinguish the radical from the nonradical part, they have to be standardized features of a sign situation in a given language. But then they are not mere phonetic, but semanto-phonetic, features.

On the other hand, it is just as impossible to define the two components of a derivational word in purely conceptual terms.[37] Although it may be said that the concepts reflected in nonradical parts are normally abstract, those reflected in radicals are often equally or more so. Compare, for instance, the concepts suggested by the two constituents of the word *abstract-ly.* Besides, the same concept can be connected with a radical as well as a nonradical element. The concept of plurality as reflected in the nonradical part of *door-s* is very

[37] *Cf.* pages 198*ff.*

much the same as that reflected in the radicals *many, several, plural,* etc. Nor has one concept, considered as such, essentially a modifying character while others would be necessarily modifiable or modified. In the two words *housedoor* and *doorpost* the reference symbolized by *door* reflects the same concept; but in the former it is modified, in the latter it modifies. The concept of plurality as reflected in language may modify that of manner or it may be modified by it; compare the words *manner-s* and *plural-ly.*

The Only Criteria Semanto-Phonetic

In order to understand the difference between radical and nonradical elements it is absolutely necessary to consider them as semanto-phonetic units. As soon as we let one of these two aspects drop out of sight, it is impossible to define them against each other. Word symbols symbolize references which, as we have seen, are complex. This allows the same symbol to be used in the sentence with many different specified and located references. Now it may happen that all the possible aspects of a reference are collectively symbolized by a phonetic unit which to the speaker's feeling is indivisible. For instance, the English symbol *skate* symbolizes a compound reference with a great variety of possible aspects, none of which is more specifically symbolized than the others. No phonetic relief is given to the facts that a particular grammatical aspect is intended, that skates are like shoes, that they are used on the ice, that they are made of steel, that reference is made to an action rather than to an object, etc. In German there is no equivalent for such a word. The Germans cannot help symbolizing in their language that skates are like shoes—*(Schlitt)schuh;* that they are used for sliding purposes—*Schlitt(schuh);* whether the action of skating is meant—*schlittschuhlaufen,* or the object with which the action is performed—*Schlittschuh.* If the action is symbolized, an additional referential feature must be phonetically

brought out, namely, that skating is similar to running—*(schlittschuh)laufen*. Furthermore, it is impossible in German to leave certain grammatical aspects without specific symbolization. Because *Schlittschuh* lacks a certain ending, the referent is referred to as singular; because of the ending *-en*, *schlittschuhlauf-en* can refer to the action only with certain impersonal, personal, temporal, or congruential aspects; that is, it can be only the infinitive or the first or third person plural of the indicative or subjunctive present. Does that mean that the concepts of skates and skating are not the same with Germans as with Englishmen? By no means. These concepts are the result of nonlinguistic experiences; as long as skating is done and experienced in the same way in Germany as in England and as long as skates are the same type of objects in the two countries, the concepts will be very much the same. In English also we can, if we wish, express all those peculiar referential aspects and many others besides. Various devices, such as paraphrasing, word order, congruence, etc., may be used for that purpose. But it is done only when special reasons make it advisable; it is a free procedure. In German, on the contrary, the reference to the action of skating is linguistically isolated apart from the reference to the object, and either of these references is presented by a symbol which systematically supports certain specific referential features. The difference between German and English as regards the words under discussion is not one of concepts, but of manner of presentation. In German certain referential aspects are traceable to corresponding parts of the symbol; in English practically all the aspects of the reference are collectively symbolized by one indivisible symbol.

The question that is before us is this: supposing that a reference is symbolized by a synthetic symbol to whose components various referential aspects can be traced separately, which of these components is the radical, which is the

nonradical part, and why? It is frequently asserted that in a set of words like *father*, *father-s*, *father-ly*, *father-less*, *father-hood*, *father-ing*, (*he*) *father-s*, (*he*) *father-ed*, the first part, namely, *father-*, is the radical, because it is constant and common to all the words of the set. Little attention is needed to realize the shallowness of such an argument, for a natural inference would be that the changing parts are necessarily nonradical. That this is not so is immediately evident from a set of compounds like *dustpan*, *dustbox*, *dustman*, *dustbin*, where both the common and the changing parts are radicals. Moreover, in such a series of words as *great-ness*, *good-ness*, *thick-ness*, *far-ness*, etc., the changing part is the radical and the constant one is the nonradical element. Nor is it a much better formulation to say that the radical usually occurs in the language as an independent word, whereas the nonradical component never does. To the latter half of this statement we may not wish to object,[38] but we have seen that a radical often needs more than purely phonetic trimming in order to become a word; compare the German word *brechbar* ('breakable'), whose radical *brech-* always calls for a semanto-phonetic expansion. In so-called synthetic languages[39] the radicals that never occur as independent words are very numerous indeed.

Radical and Nonradical Elements Defined

The truth is that there exists no general and universal criterion for the distinction between the two elements under discussion. Such a distinction is the result of an absolutely subjective and conventional appraisal of two separable word elements with respect to each other on the part of a particular speaking community. This appraisal is no doubt the interpretation of sign situations, but of most subtle and complicated ones, conventional and different from one language or

[38] However, compare the use of *isms* as a noun. *Cf.* page 147.
[39] *Cf.* page 329.

linguistic period to another. We may say that the fact of being a radical or a nonradical element is a referential aspect of parts of word symbols which is just as conventionally in context with its symbolic counterpart as, let us say, the reference of *window* is with its corresponding symbol in a particular language. If we wished to describe the sign situations whose interpretation results in the appraisal of certain word parts as radical and of others as nonradical, it would be necessary to examine in particular each case in a given language at a given time. Such a description would be in terms of historical development and of empirical conditions such as the relative position of the components, the morphological and syntactical treatment, accentual relations, systematic structure and contrast, etc. The difference between radical and nonradical is the result of the generalized interpretation of complex sign situations as to the relationship of the two semanto-phonetic parts of a morphological word.[40] The radical is that part which is interpreted as the basic one of a word symbol inasmuch as it also symbolizes the basic reference from which others are felt to be derived. The nonradical element is that which is interpreted as a mere formal increment to the radical symbol inasmuch as it also symbolizes a purely incremental modification of the basic or radical reference. For this reason the nonradical part is often termed the *formative element*: it is interpreted as merely giving a definite form to a fundamental but amorphous symbol and reference. Hence a radical may be defined as a recurrent semanto-phonetic part of several morphological words in which the changing elements are interpreted as mere incremental modifications of the constant component; but it may just as well be described as the changing semanto-phonetic part of several morphological words in which the constant elements are interpreted as mere incremental modi-

[40] *Cf.* Bréal, *op. cit.*

fications of the changing component. To any English interpreter the aspect symbolized by [-z] (spelt *-s*) in the word *father-s* (plural of the noun) appears to be presented as a mere modifying increment to that which is symbolized by *father-*. The latter is the basic or radical part, not because from a conceptual point of view the concept of plurality necessarily modifies as a mere increment the concept of fatherhood, but because the plural aspect of the reference of *fathers* is linguistically presented as such a modifying increment. By saying "more than one father" we symbolize practically the same reference as by using the symbol *fathers*; but the manner in which the referential aspects "father" and "plural" are presented linguistically is not the same in the two cases. In "more than one father" both aspects are given and interpreted in a relationship of radical to radical. If we said "more fathers than one," we should present the aspect of plurality both as incremental and as radical at the same time. There are languages in which the radical manner of presentation and interpretation is the only one used in connection with the plural of references. The English symbol *pluralities* even symbolizes a reference to a substantivated abstraction *plurality* with the incremental aspect "plural." By the symbol *socialism* the referential aspect symbolized by *-ism* is presented as purely incremental, while in a sentence like "He is very fond of isms" it is given as a radical.

Incremental Aspects of Nonradical References

It has now become imperative to examine what these incremental aspects of nonradical references and symbols may be. As far as the referential aspect is concerned,

1. It may modify the reference in itself, without any regard to its syntactical relationship in the sentence. Thus, the referential increment symbolized by the nonradical element *-hood* in the word *fatherhood* modifies the reference of *father* as an isolated word without any indication as to its relationship

to other words within the sentence. Such an incremental aspect is purely *lexicological.*

2. It may modify the reference so as to characterize it as that of a specific kind of word recognized as such in a particular language at a given time. In the word *likelihood* the referential aspect symbolized by *-hood* characterizes the finished word as a noun; the aspect symbolized by *-ly* determines the adverbial character of words like *greatly, beautifully,* etc. Nouns and adverbs form specific lexicological categories in English. We shall see in a later chapter that categorial classifications are subject to variations according to the language concerned and its historical period. In Chinese, for example, the distinction between verb, noun, and adjective is not indicated by any symbolical increment of the finished word. Incremental aspects of this type are both lexicological and *categorial.*

3. It may modify the reference so as to relate it systematically to other parts of the sentence. In the Latin word *domin-um* the nonradical symbol *-um* symbolizes among other things that the complete word exercises a certain function in the sentence. Such incremental aspects as these are *functional* or *syntactical.*

4. It may modify the reference so as to indicate its congruential togetherness with other word references in or outside the sentence. Thus, the formative element *-a* of *pulchra* in the Latin expression "pulchra femina" symbolizes among other things that the adjective belongs to the feminine noun with its reference to a female person. This modifying increment of sex is, of course, absolutely irrelevant to an adjective as such. It may be called *congruential.*

It is easy to see that these various incremental references are not exclusive of one another. In *fatherhood* the referential aspect symbolized by *-hood* is not categorial, since both *father* and *fatherhood* are nouns. In *likelihood,* on the contrary, it is both categorial and lexicological, because *likely* is

an adjective whose lexicological category is changed by the incremental *-hood.* Inasmuch as the symbol *-a* of Lat. *femina*[41] symbolizes the feminine aspect of a nominal reference, it is lexicological and categorial; inasmuch as it symbolizes the syntactical aspect (subject, attribute, etc.), it is syntactical. Besides, the same referential aspect may be symbolized by means of different incremental symbols in the same language. Compare the symbolization of the plural aspect of nominal references in the English words *fathers, houses, cats, mice, oxen* ([-z], [-ɪz], [-s], radical change, [-ən]).

Derivational Symbolization through Affixes

Types of Affixes.—The symbolizing features of nonradical elements, too, may be very diverse. The most conspicuous form is found when a certain sound or sound combination is added to the radical. It goes without saying that such sounds must have a semantic significance in order to be considered nonradical or formative parts; otherwise they are mere phonetic variations of the radical. The generic name for these semanto-phonetic additions is *affixes.*[42] According as they are added at the beginning, in the middle, or at the end of the radical, they are called *prefixes, infixes,* or *suffixes.* The latter are usually given the name of *endings* when their corresponding referential aspect is not purely lexicological but also or exclusively syntactical or congruential. Thus, in the Latin words *domin-um, ama-nt, pulchr-a,* the suffixes *-um, -nt,* and *-a* are endings. Affixes whose referential aspect is lexicological, such as *-hood, -ly, -ness* in English, are known as *derivational.* It often happens that certain acoustic and physiological varieties of a particular affix are psychologically regarded as identical. The English plural suffixes in the words *cats, boards, houses* are phonetically represented by [-s], [-z], and [ɪz], but these three different forms are

[41] *Cf.* page 204. [42] *Cf.* page 136.

felt as mere variations of the same suffix, if indeed their difference is realized at all.

Vocalic Harmony.—A peculiar type of affix is that of which the vocalic part changes with the vowels of the various radicals to which it is added. This phenomenon, known by the name of *vocalic harmony*,[43] is mechanically an assimilation; semantically it is a congruential sign fundamentally cognate to the type of congruential affixes so familiar to all who have studied Latin; compare Latin *ist-a pulchr-a femin-a, me-us bon-us fili-us.* Vocalic harmony is especially common in many languages of the Finno-Ugric group. In Turkish the plural suffix is *-lar* if the radical vowel is [a], [ɔ], or [u], it is *-ler* if the vowel of the radical is [ɛ], [œ], [y], or [i]; for example, *baš-lar* ('heads'), *ot-lar* ('herbs'), *kul-lar* ('slaves'), but *ev-ler* ('houses'), *gœz-ler* ('eyes'), *jyk-ler* ('loads'), *dil-ler* ('tongues'). Here is an example from Manchu: *ala-ha* = '(I) have told', but *gene-he* = '(I) have gone', *tokto-ho* = '(I) have arranged.' In Hungarian *kert-e* = 'his garden', but *haz-a* = 'his house.'[44]

Diversity of Affixing.—Of the three kinds of affixing, suffixing is undoubtedly the most widely spread and infixing the least. There are languages which use only suffixes, others, less numerous, know only prefixes, and still others are both pre- and suffixing at the same time. Again, in the latter languages there is much fluctuation as to the relative importance of the one or the other method. In the majority of the dialects of Mon-Khmer spoken in southern Asia and Malacca the only kinds of affixes known are pre- and infixes to the exclusion of suffixes. In Latin the prefixing method is confined to lexicological derivations while suffixes symbolize any kind of incremental reference. Elsewhere both pre- and

[43] *Cf.* pages 232, 332.

[44] *Cf.* F. N. Finck, *Die Haupttypen des Sprachbaus*, p. 74; Antoine Meillet and Marcel Cohen, *Les langues du monde*, pp. 160*ff.*; H. G. C. von der Gabelentz, *Die Sprachwissenschaft*, p. 199; J. Csink, *Hungarian Grammar*, pp. 182*ff.*

suffixing are used with a functional meaning. In the conjugation of the Iroquois verb the personal relation is symbolized by a prefix, whereas the relationship of tense, "Aktionsart,"[45] and mode are sometimes rendered by means of both prefixes and suffixes. Iroquois ['ka-tka·hto·s] = 'I see', [sa-tka·hto·s] = 'you see', [ra-tka·hto·s] = 'he sees', [sewa-tka·hto·s] = 'you (plur.) see', [ẽ-ka-tka·ht-o] = 'I shall see', [ẽ-sa-tka·ht-o] = 'you (sing.) will see', etc. In some languages the affixing method is not used at all or only in a very rudimentary way. Thus all Chinese words are simple or compound, never derivational.

Infixing.—Infixation consists in inserting one or several sounds into the radical itself. Again it is important to remember that such insertions must be semanto-phonetic elements; otherwise they are not infixes but mere phonetic expansions of the radical. Frequently infixed sounds are nasals and liquids. In Latin the *-n-* of *vi-n-co*, *vi-n-cebam* contrasts the present and its derived tenses with the perfect *vici* and its derivations *vicissem*, etc. Compare also Gr. *ma-n-thánō*, 'I learn', and *mathêsomai*, 'I shall learn.' In the languages of Mon-Khmer the *-n-* infix generally forms instrumental nouns and adjectives. Mon *put* = 'to chisel', *p-n-ut* = 'scissors'; Khasi *kian* = 'grandmother', *ke-n-ian* = 'old'.[46] In Indonesian the infix *-um-* gives the radical a verbal active meaning, whereas *-in-* endows it with a verbal passive meaning. Dayak *k-um-an* = 'to eat', *l-um-angoi* = 'to swim'; but Tagal *t-in-āwag* = 'to be called', Malagasy *t-in-apaka* = 'to be broken.'[47] In English we have nothing

[45] Namely, such aspects of an action as duration, repetition, intensity, etc. See page 201.

[46] *Cf.* Meillet and Cohen, *op. cit.*, p. 393.

[47] *Cf. ibid.*, pp. 422–23. In the dialect of the Duke of York Island, nouns are formed from verbs by infixing *-in-* or *-un-* after the initial consonant of the word: *papam* = 'to do', *pinapam* = 'a plantation'; *papet* = 'to pray', *pinapet* = 'a prayer'; *mat* = 'to die', *minat* = 'a corpse.' *Cf.* George Brown and B. Danks, *Dictionary and Grammar of the Duke of York Island Language*, p. 4.

in the way of an infixing process. It can hardly be said that the *-n-* of *stand* is felt as an infixed element with a specific meaning, since whatever referential aspect it may be deemed to symbolize is undoubtedly represented more conspicuously by the vocalic change of the radical, *stand–stood.*

Semantic Classes of Affixes.—From the point of view of their semantic value we may classify the affixes as *verbal* and *nominal* according as they are used for the formation of verbs and verbal forms, on the one hand, or nouns, adjectives, numerals, or pronouns, on the other. Nominal affixes are in their turn *abstract* if they symbolize an abstract referential aspect; they are *concrete* if they symbolize a concrete referential feature; they may be classified as *masculine, feminine, neuter,* or other specific *gender* affixes; as *diminutive, agentive, collective,* etc. Similarly, verbal affixes may be *causative, durative, iterative, frequentative, intensive,* etc. Moreover, if an affix is still a current means of word formation, it is said to be *living* or *productive.* Such are, for instance, the English suffixes *-ness, -ly, -ing,* the agentive suffix *-er,* etc. On the other hand, affixes that have survived only in a limited number of words and are no longer used in the formation and derivation of new ones are called *unproductive.* An example is the English suffix of native abstract nouns *-th,* as in *wealth, health, death, depth,* etc.

Cumulative Derivation.—Like the compound, the derivational word is always a binary construction, that is, it is decomposable into two parts; thus, *beautifully* = *beautiful* + *ly.* If both parts are felt to be simple units, as with *beauti* + *ful,* the derivation is said to be *primary;* if one of the two elements is already a primary morphological construction, as with [(*beauti* + *ful*) + *ly*], its combination with the other part is called *secondary.* A word like *disagreeably* = {[*dis* + (*agree* + *able*)] + *ly*} is a *tertiary* product; *disagreeability* would be a *quaternary* combination, etc., and the derivational complexity may be much greater still.

Derivational Symbolization through Change within the Radical

Vocalic Change.—A subtler and less conspicuous type of derivational symbolization consists of some incrementally significant change of the radical. Vocalic changes are considerably more frequent than consonantal ones. A good illustration of the former is supplied by the forms of the so-called strong or irregular verbs in English: *come–came, find–found,* etc. Here the change of the radical vowel has become an important means of indicating the tense. Also outside of the verbal conjugation vocalic modifications of the radical serve to symbolize incremental referential aspects; compare such English words as *sing–(–sang–sung)–song, mouse–mice.* Semanto-vocalic change is of greater importance in some languages than in others. In those of the Semitic group the center of the word is usually a radical consisting essentially of consonants. That is, the consonantal part of the word is felt to symbolize the basic reference and is constant in the various derivations; the changing parts of the word are the vowels, which are felt to symbolize some incremental aspect of the reference. Thus, in Arabic the consonantal radical *ktb* symbolizes the fundamental reference to 'writing'; hence *katab* = 'he wrote', *kâtib* = 'writer', *kitâb* = 'book.' Similarly, *rajul* = 'man', *rijâl* = '*men*'; *ḥabb* = 'he loved', *ḥabîb* = 'friend';[48] *katal(a)* = 'he killed', *kutil(a)* = 'he was killed', *kattal(a)* = 'he murdered', *kuttil(a)* = 'he was murdered', *kâtil* = 'killing', etc. Semanto-consonantal changes of the radical are occasionally met with in English. The difference between *house* (noun) and *house* (verb) is symbolized by the different pronunciation of final *s,* although this is accompanied by accentual changes which are perhaps more significant. Other examples are *release* (noun) and *release* (verb), *wreath*

[48] *Cf.* Finck, *op. cit.,* p. 97. The symbol *ḥ* stands for a guttural voiceless fricative.

and *wreathe*, etc. There is, however, nothing consciously systematic about the process in our language. Elsewhere, for instance in Arabic[49] or in some of the languages of the Senegalese-Guinean group, semanto-consonantal changes of the radical are quite a regular method of derivational symbolization. In Peul, Wolof, and Serere, three languages of the above-mentioned African group, the nouns are distributed over a certain number of categories or classes which are characterized by the initial consonant of the radical. This initial consonant is for the same radical now a fricative, now an occlusive, then again a nasalized occlusive, according to the various classes.[50]

Reduplication.—Next we must mention the type of derivational element which is obtained through the process of reduplication. Either part or the whole of the radical is repeated and symbolizes an incremental aspect of the basic reference. In English reduplication is not unknown, but it is used rather as a means of composition or as a free process of sentence structure. Thus, we have words of the type of *goody-goody* or alliterative and assonantic products like *flip-flap, sing-song, roly-poly*, etc. In sentences a word is sometimes repeated for the sake of emphasis: "He works, works!" for "He works very hard;" "It's a cold, cold day!" for "It's a very cold day!" In many languages, however, especially in those of the Malay-Polynesian group, reduplication constitutes a regular grammatical process. Semantically it may symbolize various referential aspects, the most important of which are:

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[49] For instance, in Arabic verbs a doubling of the consonant results in a semantic intensification: *darab* = 'be beat', *darrab* = 'be beat violently'; *qaṭa'* = 'be cut', *qaṭṭa'* = 'be cut in pieces'. The result of this gemination may also be a causative verb: *dakẖal* = 'he entered,' *dakẖkẖal* = 'he caused someone to enter', 'he introduced', etc. (*ḍ* = a hard palatal *d*; *ṭ* = a hard palatal *t*; *t̲* = like the *th* in *thin*; *kẖ* = guttural, like the Scotch *ch* in *loch*.) *Cf.* A. O. Green, *A Practical Arabic Grammar*, 4th ed. (Oxford, 1915), Part I, pp. 123, 124.

[50] *Cf.* Meillet and Cohen, *op. cit.*, pp. 553–54.

1. The plural aspect of nominal references. For instance, in Malay *orang* = 'human being', *orang-orang* = 'human beings.' In Japanese *tabi* = 'time', *tabi-tabi* = 'many times', and *tókoro* = 'place', *tókorotókoro* = 'places';[51] in Chinese *jên*^{2} = 'human being', *jên*^{2}-*jên*^{2} = 'everybody.'[52]

2. The aspect of tense or "Aktionsart." For example, Skr. $\sqrt{GAD}$ = 'to speak', *jagâda* (*gagâda*) = 'I have spoken.' Lat. *spondeo* = 'I promise', *spoposi* = 'I have promised'; *do* = 'I give', *dedi* = 'I have given.'

3. The aspect of intensification of the radical reference. For example, Chinese *liao*^{2} = 'alone', *liao*^{2} *liao*^{2} = 'very much alone'; Old Javanese *angin* = 'wind', *angin-angin* = 'tempest.'[53] It sometimes happens that the radical is repeated several times. In Mentaway, a language of the Polynesian group spoken on the island of Mentaway, west of Sumatra, the expression *igi-igi-igi-igi*[53] means 'more numerous than anything imaginable.'

4. Some lexicological aspect. For example, Engl. *murmur*, Fr. *cricri* ('cricket') (onomatopœias); in Quechuan, a South American Indian language, *palla* = 'to collect', *palla-palla* = 'collector'; similarly, the international words *mama*, *papa*, *dada*, etc. In the Duke of York Island language the reduplication of the initial syllable of verbs results in instrumental nouns: *kili* = 'to dig', *kilkil* = 'a spade'; *aki* = 'to break', *akak* = 'a hammer'; *akari* = 'to bewitch', *akakara* = 'a spell'; *balui* = 'to recompense', *babalu* = 'a recompense.'[54]

Accent.—Accent, too, may have the value of a derivational element, inasmuch as it may symbolize an incremental aspect

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[51] *Cf.* August Seidel, *Grammatik der japanischen Umgangssprache*, p. 17.

[52] For our Chinese illustrations we use the Wade system of spelling. The tones are indicated by small figures placed after the word. *Cf.* Martin Heepe, *Lautzeichen und ihre Anwendung in verschiedenen Sprachgebieten*, pp. 96*ff.*; and C. W. Hillier, *The Chinese Language*, I, pp. 23*ff.*

[53] *Cf.* Meillet and Cohen, *op. cit.*, p. 433.

[54] *Cf.* Brown and Danks, *op. cit.*, pp. 5, 6.

of the radical reference. In this connection it should be remembered, however, that it is very difficult to isolate accent from other accompanying phonetic features, such as vowel or consonantal modifications. In English the stress accent has occasionally an incremental semantic value; compare such words as (*to*) *prodúce* and *próduce* (noun), (*to*) *extrâct* and (*an*) *éxtract*, (*to*) *break dówn* and (*a*) *bréakdown*, etc. But as a regular grammatical process of word formation and flection stress is rather exceptional.

Pitch seems to be more widely spread as a morphological device. We have nothing in English that could convey an idea of what that means. In Chinese pitch is a most important means of semantic differentiation. The same sound combination may have different meanings according to its musical intonation. Spoken Mandarin distinguishes four different tones; the written language, five; the other spoken dialects use various numbers of them, sometimes as many as thirteen. In Pekinese *shih* pronounced with an even tone means 'corpse'; with a rising one it means 'ten'; with a falling-rising intonation it stands for 'arrow'; and with a falling tone its meaning is 'scholar.'[55] Yet it would not be justified to regard pitch as a nonradical element in Chinese, because the references of the specifically pitched words are not differentiated by mere incremental aspects, but by their basic or radical features themselves. Pitch is here a constituent of the radical just the same as the consonants and vowels; it has an etymological, not a grammatical, value. Similar conditions prevail in the African languages of the Sudan, where it often happens that a word with entirely different vocalic and consonantal elements but with identical pitch in different dialects is etymologically the same; any one of the dialectal forms is understood by the representa-

[55] *Cf.* Von der Gabelentz, *Chinesische Grammatik*, § 99–109; Chiu Bien-Ming, "A Phonogram in Chinese," *Vox*, 1 Mai, 1930, Heft 2, pp. 33–29. See also on page 173 of this book.

tives of the other dialects as long as the same pitch is preserved.[56] In order that pitch be a nonradical element it is essential that it be felt as symbolizing by itself a mere incremental referential aspect. This condition is realized, for instance, in Massai, a language of the Nilo-Equatorial group, where a high tone characterizes a noun as the subject of a verb, a low tone as the object.[57] Similar cases are quite frequent in many other dialects of the African negroes. It seems to be a general rule that wherever in these dialects pitch has a grammatical value, a low tone symbolizes the affirmation while a high one suggests a negation, a diminutive, pejoration, a singular, or the speaking person.[58]

Combination of Symbols.—Finally, a referential increment may be symbolized by a combination of two or more of the above-mentioned procedures. In Old Indian (Sanskrit), for instance, the plural of the verb in the perfect tense may be characterized at the same time by a specific vowel (or lack of vowel) in the radical, by a suffix, and by the accent on the suffix; for example, singular *ja-ján-a* = 'I have engendered', plural *ja-jñ-imá* = 'we have engendered.'[59] In German the plural *Gäste* ('guests') is symbolized by both the radical vowel and by the suffix *-e*.

Roots

Until now we have always considered the radicals from a static point of view, that is, as they are interpreted as the radical parts of morphological words in a given language at a given time. It is obvious that a comparison of a number of cognate languages at various stages of their history must result in the determination of radicals quite different from those discussed in the above paragraphs. In English *father*

[56] *Cf.* page 173.
[57] *Cf.* Meillet and Cohen, *op. cit.*, p. 490.
[58] *Cf. ibid.*, p. 474.
[59] *Cf.* Rudolf Meringer, *Indogermanische Sprachwissenschaft*, pp. 116–17. (*ñ* = a palatal nasal.)

is the primary radical of a set of words like *fathers, fatherly, fatherless*, etc., but an historical comparative study of the word soon shows that only *fa-* represents the radical part while *-ther* is a suffix. Compare Greek nominative singular *pa-tḗr*, genitive *pa-tr-ós*, accusative *pa-tér-a*; Latin nominative *pa-ter*, genitive *pa-tr-is*, etc. Hence, from an historical viewpoint *father* is a secondary radical, and lexicologically it is not simple but morphologically complex. Radicals that are the result of such comparative and historical abstraction are called *roots*. They are the ultimate constant units common to all the cognate words and forms known in all the related languages, due consideration being given to the various laws of phonetic change and of analogical influences. In linguistics roots are often designated by capital letters placed under the mathematical symbol $\surd$. Thus, the root of the Hebrew forms *gâzal* ('he robbed'), *gōzēl* ('robbing'), *gāzūl* ('robbed'), etc., is represented as $\surd\underline{GZL}$. That of such words as Germ. *Kind*; Engl. *kind, kin, benign, general, genitive, nation, germ, germane, malignant, genuine*; Fr. *né, engendrer, naissance*; Lat. *gigno, genus, natus*, etc., is I.-E. $\surd\underline{\hat{G}EN\bar{E}}$, $\surd\underline{\hat{G}EN\bar{O}}$, with the basic meaning of 'to bring forth.'

Etymology is the branch of linguistics which studies words and forms and their phonetic and morphological relationships with a view to tracing them to their ultimately inferable reduction. For a long time it was believed that roots were essentially monosyllabic and that at the very origin of language they were the only elements of speech. All primitive words were supposed to be roots of one syllable. It was thought that gradually some of them were used to determine and modify others, both lexicologically and syntactically, and that in this way affixes and endings developed. Declensional and conjugational suffixes were explained as being rests of original pronominal roots which were used to symbolize relational aspects of nouns or verbs. The German

linguist Schleicher (1823–1868) in his *Kompendium der vergleichenden Grammatik* expressed the opinion that the highest degree of perfection is reached by a language when it has gradually evolved a system of abundant richness in forms. Such a language was Primitive Indo-European; its morphological wealth was by far superior to that of its later descendants, whose suffixes and endings were gradually worn off, so that many formerly complex morphological words became again monosyllabic radicals. Schleicher[60] considered language as an organism, born as a system of monosyllabic roots, growing and developing into a high state of morphological richness, and finally decaying by the loss of flectional affixes. In the historical period all Indo-European languages reveal striking symptoms of this alleged decay.

Today these views are looked upon as romantic curios. In his *Mémoire sur le système primitif des voyelles dans les langues indo-européennes* (1879) Ferdinand de Saussure has established the necessity of admitting primitive Indo-European roots of more than one syllable. For the belief in the existence of an original root period modern linguistics has substituted the conviction that roots, at least in the sense defined above, are mere analytical abstractions. They are useful for the understanding *a posteriori* of the morphological make-up of words, but they are utterly fallacious as indications of what the primitive word was. It is impossible to say which and how many of such roots may have existed as real words. As far as Indo-European is concerned, everything points to the fact that it was characterized by a cumbersome wealth of morphological forms, by long and complex words for whose translation our modern languages often require paraphrases or even whole sentences. Outside of

[60] *Cf.* August Schleicher, *Die deutsche Sprache*, 3rd ed., pp. 119*ff.*; Schleicher, *Compendium der vergleichenden Grammatik der indogermanischen Sprachen*, pp. 2, 4, 5. See also on page 359 of this book.

Indo-European we find that many savage tribes, with a degree of culture decidedly inferior to ours, speak languages of the most intricate polysynthetic and incorporating type. The accumulation of morphological parts in single words, with meanings which are relevant only in certain specific cases and perfectly useless in others, is a heavy weight impeding the progress of man and language toward greater analysis and flexibility of expression.

CHAPTER IV

ACCENTUATION

Meaning of Accent

The Popular Meaning

In ordinary usage the term "accent" symbolizes a reference to something which the speaker himself might be at a loss to define. The expression "He speaks (English) with an accent" is found to be a handy means of characterizing somebody's speech as betraying the influence of habits extraneous to the language spoken. As a rule, a person's ear is very sensitive to heterogeneous shades of pronunciation when his mother tongue is involved. Of an orator with a rhetorical diction it will not be said that he speaks with an "accent" so long as he does not sin against the tendencies and habits peculiar to the language employed; yet rhetorical speech is decidedly different from that used in conversation. But if a Scotchman or a German speaks English with even a considerable degree of perfection, his "accent" does not often pass unnoticed. Ordinarily the hearer will not be able to explain exactly what it consists of or is produced by. He will simply label it with such general epithets as "foreign," "Scotch," "German," "broad," "singing," etc.; or if a certain peculiarity is very striking in the speaker's enunciation, it alone will be made responsible for the strangeness of his "accent." As a matter of fact, a good deal of knowledge and experience is required for the analysis of a person's speech. That which is referred to as the "accent" in the sense under discussion here is a most subtle complex of peculiarities which collectively produce the impression of exotism.

The term, it is true, is generally suggested only by discrepancies of pronunciation and diction: we do not say that a person "writes" with an accent. When the peculiarities imply grammatical or stylistic divergences, we refer to them as mistakes, unusual expressions, solecisms, barbarisms, etc. But mere pronunciation and diction are phenomena sufficiently complicated to lead the nonprofessional observer astray. It would be impossible for him to distinguish between such features as the basis of articulation, timbre, the distribution of breath and voice, the processes of assimilation, stress, pitch, quantity, etc. It is needless to insist that with the meaning described above the term "accent" is altogether too vague, and consequently useless in scientific terminology. In German, when used in this popular sense, it is usually given the French pronunciation.

Accentuation

The term is further used to imply the greater relief given to one syllable or one word with respect to others in a group. Thus we say that in a given word or sentence such a syllable or word "has the accent" or "is accented," while the others are said to be "unaccented." In this connection the symbol "accent" refers either to stress or to pitch or to both combined, according as one or the other of these features is more generalized in a given language. Words with the accent on the last syllable are called *oxytones*, those having it on the last but one are *paroxytones*, and those which are accented on the last but two go by the name of *proparoxytones*. However, we have seen in an earlier chapter that stress and pitch are common to all speech sounds; that is, no sound can be produced without any stress or pitch at all. It would be more correct, therefore, to distinguish between more and less accented syllables or words rather than between accented and unaccented ones. And even with this qualification the present use of the term is misleading. For within the syllable

and within the word themselves the accent, whether stress or pitch, is seldom even. It is an essentially flowing element, rising and falling with various degrees of suddenness or sloping transitions. We may speak of the "accent" of a syllable or a word as compared with that of neighboring ones only if we keep in mind that the term has then a collective and relative meaning; that it refers to the accentual ups and downs of one syllable or word taken as a whole and compared with the ups and downs of other syllables or words also considered as units. Accent as a flowing feature of speech is perhaps better called *accentuation.*

The Etymological Meaning

From an etymological point of view, the word is a translation of Greek *prosōidiá* (*pros* + *ōidḗ*) and means the tune sung to speech, the melody accompanying pronunciation. In Ancient Greek the chromatic or pitch accent was a more striking feature than stress, and this accounts for the emphasis laid upon melody in the Greek name. When the Romans translated it into Latin (*ad* + *cantus*), it was intended to symbolize the type of accentuation prevailing in their own language. Opinions are divided as to whether in the classical period of Latin the prevailing accentual type was pitch or stress,[1] but in subsequent periods it was decidedly the latter, as must be concluded from the development of the Romance languages.[2] Yet the symbol "accent" was not abandoned when its referential value had changed. Likewise in English, where the chromatic accent is of no importance for the word, the term "accent" primarily refers to stress, whereas the

[1] *Cf.* Wilhelm Meyer-Lübke, *Grammaire des langues romanes*, I, p. 533; Ferdinand Sommer, *Handbuch der lateinischen Laut- und Formenlehre*, pp. 83–112. In general it may be said that German and English scholars are inclined to the stress theory while Frenchmen rather favor the pitch theory.

[2] *Cf.* page 167. An enormous number of unaccented vowels and syllables disappeared or were subject to thorough changes.

Greek term "prosody" has acquired a technical meaning used only in connection with metrical composition.

Accent a Collective Name

We have previously seen that stress, pitch, and quantity are often parallel phenomena: greater stress is likely to be accompanied by higher pitch and increased length, so that the accent of a syllable is often considered as the combined result of stress, pitch, and quantitative conditions. This parallelism is by no means necessary and constant, but it has sometimes caused the term "accent" to apply as a common symbol to these three heterogeneous features. Duration is then referred to as the *quantitative accent*, while stress and pitch are grouped under the rubric of *qualitative accent*. In recent years, however, quantity is being more and more strictly kept apart from other phonetic elements.

Stress

Syllabic Stress

Accentuation can be studied as it affects the syllable, the word, the stress group, or the sentence. Within the syllable the *stress* or *dynamic accent* is sometimes relatively even from the beginning to the end, although such *level* syllabic accentuation is rather rare, especially in syllables consisting of more than one sound. As a rule there will be a noticeable difference between the beginning and the end of the syllable, caused by a gradual accentual decrease (*falling stress*), or by a gradual increase (*rising stress*), or by an increase followed by a decrease (rising and falling stress combined). In all these instances there is only one accentual crest or top. But it also happens in other instances that within the same syllable two stress tops coexist, one being primary and the other a minor one. Strictly speaking, we should in such a case recognize two successive and separate syllables, but the secondary reinforcement is felt to be so unimportant and

overshadowed by the major top that the feeling of syllabic unity is not destroyed. Naturally, stress with a double top is found chiefly in long syllables, particularly in those whose sonant is long. Vowels with two stress tops easily give rise to diphthongs in the course of historic development. Further, the stress within the syllable may be very shortly and suddenly interrupted as the result of a glottal closure and then be resumed again in a weaker fashion. Here, too, we strictly have two distinct syllables which, because of the relative unimportance of the interruption and the secondary top, are felt as one. The Germans call this type of syllabic stress *Stoszton*. In certain languages, for instance in Danish and in Lettish, it is a very common phenomenon.[3]

Word Stress

Word stress is the accentual curve of a word. Hence, in monosyllabic words syllabic and word stress coincide. In longer words it sometimes happens that all the syllables are more or less equally stressed, so that some sort of level or even word stress results. In English this is met with only occasionally, namely, in such compounds as *churchyard*, *mincemeat*, *fourteen*, etc.; in some languages, especially in those of the African Sudanese tribes, it is the only kind known. In such languages the various syllables are strung together quite uniformly, like beads.[4] This seems hardly possible to us, whose need for rhythmical differentiation is so deeply rooted that we are inclined to consider it as inherent to human nature. We find it practically impossible to listen to the tick-tack of a clock whose repeated noises are equally distanced and of equal strength without grouping them into rhythmical units in which one noise is subjectively stronger than the others (such as *x́xx x́xx x́xx* . . . . or *xx́x xx́x xx́x*

[3] *Cf.* Otto Jespersen, *Lehrbuch der Phonetik*, pp. 78, 79.
[4] *Cf.* Karl Meinhof, "Theoretische und empirische Tonhöhen im Ewe," *Vox*, 1916, p. 201.

. . . . or *xx́ xx́ xx́* . . . .).[5] In the Sudanese languages word stress is apparently nonexisting, so that the need for rhythm appears to be a cultural acquisition rather than a natural requisite.[6]

But conditions such as these are rare in language. Words are mostly characterized by gradual increases or decreases of stress from one syllable to another. As to the suddenness with which the stress of one syllable is followed by that of a subsequent one and as to the distance that separates the two accentual crests, there exists the greatest possible variety. In German and still more so in English the accented syllable is very strongly stressed and is surrounded by others of a considerably weaker nature. In French, on the contrary, the difference in stress from syllable to syllable is not very great. Not only in the word but also in the sentence the French syllables follow each other well-nigh uniformly in strength, with a noticeable rise only on the last. English and German are decidedly more rhythmical languages than French. There are also many possible variations in the relative position of the more stressed syllable within the word. The highest top may be found on the radical, the initial, the final syllable, on the affix, on the ending, or it may indiscriminately lie on one of several syllables within the word. Which of these possibilities is actually realized depends upon many circumstances, historical, psychic, and physico-physiological.[7] In some languages the accentuation of the isolated word is more or less fixed, no matter under what circumstances it is used. On the whole, this is true in English, although variations due to causes that we shall mention soon are apt to occur in connected speech. Other languages

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[5] *Cf.* Wilhelm M. Wundt, *Die Sprache*, II², pp. 385*ff.*

[6] *Cf.* Meinhof, *Die moderne Sprachforschung in Afrika*, pp. 80*ff.*; *Die Sprachen der Hamiten*, p. 3.

[7] *Cf.* Jacob J. A. Van Ginneken, *Principes de linguistique psychologique*, pp. 316–21.

favor what is called a *free word accent* in various degrees. The freedom may be so great that the accent of a word may lie on any of its syllables according to its flectional form or its use in the sentence, or the variability of the accent may be confined to certain syllables only. Russian allows of the greatest freedom; in Ancient Greek the position of the accentual top was movable but had to be on one of the last three syllables; in classical Latin it was the penult that had the stress top when it was long, while otherwise it was the antepenult. Lettish,[8] Czech, and Icelandic stress the first word syllable, French the last.

From an historical point of view the accentuation of the sentence is the primary cause of word stress, since the sentence is the primary unit of speech. The fixed word accent is originally the result of countless sentence experiences from which the individual word was isolated with a particular stress because it was found to be used frequently in the same rhythmical position and with a similar accentuation. But once a certain number of words had thus acquired a stereotype stress, analogy and other causes, such as phonetic development, contributed to generalizing a specific system. The French language gradually dropped everything that followed the stressed syllable of the Latin word, and the result was the French final accent.[9] The history of the isolated word tends to endow it with a fixed or traditional accent. There exists no foundation for the belief that the more accented syllable is in itself more important. The causes that have combined for the fixation of word accent are by no means primarily logical. Rhythm, analogy, pitch, quantity, phonetic history are so many forces that determine the accent of words

[8] In Lettish accentuation is said to be logical inasmuch as the root syllable is stressed; this happens to be the first. *Cf.* August Bielenstein, *Die lettische Sprache*, pp. 228*ff*.

[9] *Cf.* page 163; also Karl Voretzsch, *Einführung in das Studium der altfranzösischen Sprache*, p. 148.

irrespective of the relative semantic importance of their parts. It is rather because a certain syllable happens to be more stressed that it is *a posteriori* felt to be more important.[10]

Nevertheless, the valuation of the various parts of a word as to their relative semantic importance is one of the causes that tend to interfere with or oppose fixed accentuation. In a language with prevailing free word stress, emphasis can, of course, affect very considerably the distribution of the accent over the different parts of the word. Languages with systematically constant accent are less open to the influence of emphatic differentiation. As a rule it will simply reinforce or smooth somewhat the fixed main stress and weaken or strengthen a little the less accented parts. But occasionally even here the normal stress conditions are altogether reversed. The so-called *contrasting accent* is particularly effective in this respect. For instance, in the sentence "I did not say fourteen, but forty" the last word has an abnormal final accent. Similarly, in opposing words like *true* and *untrue*, *useful* and *useless*, *occur* and *recur*, *regular* and *irregular*, *lessor* and *lessee*, the pre- or suffix has the main stress in spite of the different normalized accentuation of the words. Another cause that is apt to change the customary word accentuation is the need of binding the various parts of a word or expression semantically together into one unit. This may result in a final accent, which is then called *unity accent* and of which we have illustrations in English compounds like *mankínd*, *whoéver*, *whereás*, *bill of fáre*, etc. Naturally, a great antagonizing force of this as well as of any kind of semantic accent is the need for rhythm. The accentual fluctuations it causes are essentially dependent upon the syllabic sequence in a given phonetic string. Since in a polysyllabic system word this sequence remains constant,

[10] *Cf.* Wundt, *op. cit.*, II[1], pp. 407*ff.*; also F. L. Saran, *Deutsche Verslehre*, pp. 46*ff.*

rhythm may tend to fix its accentuation. It is generally found fatiguing to utter two or more successive syllables with the same strength, and the tendency, therefore, is to vary the stress of different word syllables so that the highest top is followed or preceded by one or more weaker ones. If the word consists of more than two syllables, rhythm often results in establishing one main accent, immediately followed or preceded by a syllable considerably less stressed, plus a third one with a secondary reinforcement. This is a very familiar phenomenon in English, as may be seen from words like *fùndaméntal, respònsibílity, dìstribútion*, etc. Compare also the German *Lándsmann* and *Làndeshaúptmann, Hérzog* and *Grósherzòg*. In French it is much less noticeable: in a word like *considération* all the syllables are rather equally stressed, with a slight increase on the last.

Stress Groups

Rhythm acts as soon as a word consists of two syllables; but in longer fragments of speech we shall find many varieties of accentual movements which in their turn are divided into rhythmical groups called stress groups. One syllable with a strong accent is surrounded by a number of less accented ones, and together they form a unit which itself alternates with similar preceding or following ones. For instance, in the English sentence "I sáw him yésterday mórning" there are three stress groups, represented by (1) *I sáw him*, (2) *yésterday*, (3) *mórning*. A stress group may consist of only one word or of several. It may even rhythmically cut a word in two so that one or more of its syllables belong to the preceding or following group. A phrase like "an exámple of / English pronunci / átion" is divided into three groups, the second of which contains part of the last word. Sometimes one word, especially monosyllabic, leans so closely to the neighboring stress top of another word and forfeits so thoroughly the accentuation it would have in isolated use or in a different rhyth-

mical position that the two words become completely amalgamated and are eventually felt to constitute a single unit. This is known by the name of *enclisis* or *proclisis* according as the word annexed follows or precedes. Thus, in English *prithee, cannot* both *thee* and *not* are enclitic, and in current speech the personal pronouns are very often proclitically annexed by the following verb.

Centralizing Stress

In a stress group the syllable with the main accent constitutes the center around which the other syllables cluster. We have seen that the difference in strength and the suddenness of the accentual drop from one syllable to another may present many degrees. Not only is this true when we consider accentual conditions within the same language, but languages systematically favor one type or the other. Where the drops are very sudden and great, the centralizing effect of stress is likely to be felt very keenly, whereas in the opposite case it may hardly be realized at all. Hence, a distinction can be made between languages with highly centralizing and those with little centralizing stress. Examples of the former are English, German, Dutch; the latter type is represented by such languages as Lithuanian, Serbian, Czech, French, Swedish, etc. It is claimed that the African Sudanese dialects know practically no stress differentiation at all, so that with them rhythmical grouping appears to be completely lacking.[11] This lack may occur even where stress differentiation is carried out with no little intensity. An illustration is furnished by the Japanese language, where the dynamic accent is very distinct but without any apparent regularity in the alternation of strong and weak syllables. There is no tendency here to have a regular distancing of accentual top syllables from one another or to have the latter

[11] *Cf.* page 166.

regularly followed by less accented ones. The Japanese allow without any objection a long series of successive syllables to be uttered with a uniformly equal and monotonous accentuation.[12]

Rising and Falling Stress Groups

According as the accent rises or falls within a stress group, the latter will be rising, falling, or both rising and falling. In languages with prevailingly initial word accent, such as German or English, the falling stress group is the more common, though not the only type. In French the groups are on the whole rising, on account of its predominating final word and sentence accent. An example of rising and falling stress combined is found in a phrase like "Where áre you?" The various accentual groups of speech are not monotonously uniform but are shaded off against each other in many different ways. The greater freedom of prose produces a greater variety of groups than the metrical constraint of verse. Besides, the emphatic word accent may upset the natural stress curve to a considerable degree.

Sentence Stress

As to the ups and downs of the accentuation curve in the sentence, there exists, of course, a most perplexing number of possibilities. Each language, however, generalizes a certain accentual system which it is important for anyone to know who undertakes to study the spoken form of the language. In German and English the sentence stress is prevailingly falling; the French normally speak with a rising stress curve; combinations of rising and falling accent may be found in all languages, either as occasional phenomena of speech or as systematic accentual patterns.

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[12] *Cf.* E. R. Edwards, *Etude phonétique de la langue japonaise*, § 126, § 142; also August Seidel, *Grammatik der japanischen Umgangssprache*, p. 3.

Chromatic Accent

One of the characteristic differences between singing and speaking is that in music the pitch of the various successive notes is kept more or less uniform and the intervals are pretty regular. In speech the fluctuations of pitch are apparently of a most whimsical character; transitional shades of a fineness unknown in music alternate with sudden and considerable drops or risings. It is very difficult for the ear to determine even the predominating pitch of a spoken sound or sound combination, as the chromatic accent too is a continuously flowing feature.

Syllabic Intonation

Stress differentiation results in rhythm or rhythmical grouping; pitch differentiation produces melody or musical motives. In the syllable, as well as in the word and the sentence, the general trend of the intonation curve may be level, rising, or falling, or it may combine or alternate these properties. As a rule, syllabic pitch presents one musical top, which is the result of either level, rising, falling, or rising-falling intonation. But syllables with two pitch tops are not uncommon, especially in languages that favor double stress tops.

Word Intonation

The chromatic word accent is in many languages something entirely secondary, being governed by various circumstances extraneous to the word as a separate entity. Thus, stress, quantity, the affective state of the speaker, the modality of the sentence (statement, question, exclamation, etc.) continually modify the intonation of the word. In such languages as English, German, and Dutch the variations of pitch within the word are essentially free. Intonation is here used only as a more or less regular and systematized feature

of syntactical or sentence differentiation. Elsewhere it distinctly serves as a means of referential or categorial word symbolization. Chinese knows several types of significant word intonation. In the previous paragraph we have mentioned as an illustration the Chinese word *shih*, which may have different meanings according as the intonation is level, rising, falling, or falling-rising.[13] It is to be observed that here the course of the flowing intonation is at least as important as the relative musical level. But the chromatic accent of the word may be so stereotyped as to involve a semantic differentiation according to the relative musical level alone; that is, the same sound combination may referentially differ according to the musical level at which it is uttered. For instance, in Ewe, a language of the African Sudanese tribes, the relative pitch level of a word is just as essential a part of the root as the consonants and vowels in other languages. Word roots consisting of the same combination of sounds may be entirely unrelated, because they are uttered now with a deep, now with a high intonation. Thus Ewe *si*, when pronounced at a high musical level, means 'hand'; at a low level, it means 'which.' The two words are just as foreign to one another as the English words *beer* and *bear*, *soon* and *seen*.[14] Naturally, in languages with a traditionally fixed and semantically significant word intonation, extraneous circumstances like stress, quantity, the sentence, modality, etc., can exert only little influence upon it. A certain monotony is inevitably the result.[15] In addition to the Sudanese dialects we may mention as languages with more or less fixed word intonation Lithuanian, Serbian, Croatian, Norwegian, Swedish. In these, however, stress is by no means unimportant.

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[13] *Cf.* page 156.

[14] *Cf.* page 156. See also Meinhof, "Theoretische und empirische Tonhöhen im Ewe," *loc. cit.*, p. 91.

[15] A considerable amount of information about the chromatic accentuation in different languages can be found in Johan Storm, ***Englische Philologie***, I, pp. 205*ff*.

Sentence Intonation

The chief function of sentence intonation is to symbolize the momentary emotive state of the speaker and the modality of the sentence. In our Western European languages rising intonation usually indicates that the sentence reference is incompletely or indefinitely symbolized; it is characteristic of interrupted sentences, questions, etc. Falling intonation symbolizes a completed or defined reference and is used, for instance, in statements and orders. The scale of absolute and relative intonation is extraordinarily rich and extensive, ranging from the softest lyrical tones to the hoarsest tones of rage and hatred.

QUANTITY

Both the dynamic and the chromatic accent may be metaphorically said to result in vertical differentiation, while quantity differentiates the various speech elements horizontally or in length. Hence there can be no question of rising and falling quantity, and the term "accent" does not seem to symbolize correctly a reference to quantity.

Linguistic Quantity

According to ancient terminology, a syllable was considered long by nature (*physei*) when its sonant was long; it was long by position (*thesei*) when it presented a short sonant followed by "more than one consonant."[16] This distinction is no longer alive in many languages. In German, for instance, the monosyllabic word *Dorf* is felt to be short, whereas the first syllable of *Do-se* appears to be long. Linguistic quantity, as has been pointed out before, is largely a subjective matter. Time as such is never apprehended directly; it is merely a yardstick for other actually existing properties

[16] *Cf.* G. E. Sievers, *Grundzüge der Phonetik*, § 658.

such as timbre, stress, pitch. What we apprehend is the flowing movement within time.

Semantic Quantity

Quantity is sometimes a means of referential symbolization. In this regard languages behave very differently. While English[17] and German recognize both semantic and meaningless quantity, French knows hardly anything but the latter. Compare Engl. *seat–sit, fool–full, feel–fill, pool–pull, seen–sin;* or Germ. *Rate–Ratte* ('instalment'–'rat') *Hüte–Hütte* ('hats'–'hut'), *Haken–Hacken* ('hook'–'heel'), *Saat–satt* ('seed'–'satiated'), *Miete–Mitte* ('rent'–'middle'). But even here the quantitative difference is accompanied by modifications of stress and timbre which are perhaps just as characteristically referential as the quantity itself. In French suchlike instances are comparatively rare, because syllabic quantity is governed by factors other than semantic ones; it is influenced by such circumstances as the surrounding sounds, stress, pitch, rhythm, syllabic conditions, the physiological and acoustic properties of the elements concerned. In Finnish at least four different degrees of syllabic quantity are pointed out as having semantic significance; thus *tuli* = 'fire', *tu·li* = 'wind', *tulli* = 'tax', 'duty'; *lu·lla* = 'to think.'[18]

Quantity a Metrical Device

Quantity may be used as a basis for the organization of the material of speech so that it gives rise to contrasting metrical groups. In languages with a highly centralizing dynamic accent a quantitative grouping directly affects more the various stress groups than the individual syllables. It is a

[17] For the English language quantity has been experimentally studied by E. A. Meyer in *Englische Lautdauer.*

[18] *Cf.* Jespersen, *op. cit.*, p. 189; also C. E. de Ujfalvy and Raphaël Hertzberg, *Grammaire finnoise.*

curious psychological fact that in these languages the tendency is to make all stress groups in connected speech of approximately the same length, no matter how many syllables they contain. That means that the length of the same syllable will be more or less indirectly proportional to the length of the group in which it occurs. The English syllable *no* when the monosyllabic answer to a question is longer than in the polysyllabic word *nobody* or in the sentence "I have no time." Witness also the gradually decreasing quantity of the German syllable *hei-* in the following series of words: *heil, heilig, heilige, heiligere.*[19] In English and German the quantitative unit of speech is the stress group; in French, where the centralizing effect of stress is considerably less pronounced, it is rather the syllable. This entails entirely different principles of versification or metrical organization. True, it would be incorrect to maintain that syllabic quantity is absolutely disregarded in English or German verse or that stress plays no part at all in French prosody. But in the former languages the natural and basic metrical unit is the stress group,[20] although external influences, such, for instance, as foreign imitation, may cause all kinds of disturbances; the natural and basic unit of French versification is the individual syllable, although accent may be exploited as an ancillary factor. In French speech only a division into larger groups marked by breath pauses and by a certain accentual rising on the final syllables of the groups is noticeable. These groups are not fixed and determined by a distinctly prominent word accentuation, as is the case in English and German. Although the quantity of French syllables is subject to changes according to their position within different breath groups, these changes are less striking because of

[19] *Cf.* Jean Rousselot, *Les modifications phonétiques du langage*, pp. 161, 245; Saran, *op. cit.*, p. 75; Jespersen, *op. cit.*, p. 180; Antoine Grégoire, "Variations de durée de la syllabe française," *La Parole*, 1899.

[20] The Germanic alliterative verse was the product of this feeling for the stress group as a metrical unit.

the lack of a strong centralizing accent. If the character of English and German speech can be compared to modern music, French speech is better characterized as plain chant.[21]

General Tempo

Finally, we may note that the quantity of speech elements varies considerably with the general tempo. This, of course, is open to wide fluctuations within the same language and even in the same speaker at different moments. But aside from that, the average speaking tempo is also different from one language or dialect to another.

Objective and Subjective Conditions in Language

Their Relative Importance

On various occasions mention has been made of the conflict between subjective and objective conditions in language. There is a good deal of hesitation in the minds of linguists as to the relative importance of these two types of conditions. To us it seems quite clear that so far as the native speakers of a language at a given time are concerned, it matters very little which sound, syllable, or word is in actual reality, let us say, the more accented or the longer one; but it is indispensable that the speakers should agree in their subjective feeling and appraisal of linguistic facts current among them. In language considered as a social means of expression and communication it is only that which the speaker intends to do, thinks he is doing, and is interpreted as doing that counts, no matter what he objectively does do. The subjective feeling on the part of the speaking community may, of course, be gradually modified as a result of conflicting objective conditions; but as long as the latter have not become subjectively conscious, they are of little or no significance for

[21] *Cf.* Eugène Landry, *La théorie du rythme et le rythme du vers français déclamé.*

the essentially expressive and communicative functions of language. E. A. Meyer had the meaningless sound combination *sórragis* . . . , which he uttered repeatedly with a distinct stress on the first syllable, recorded phonographically. When he reverted the recording disc, he heard not *sigarró-sigarrós* . . . but *sigárrosigárros* . . ., with a clear accent on *a*.[22] The cause of his illusion was in the first place the greater sonority of *a* as compared with *o*, and in the second place the fact that the sound combination thus reverted corresponded to a familiar word (*cigar*) with a traditionally fixed accentuation. It may be inferred that even though from a purely physical and physiological point of view the accentual crest were found to lie upon the syllable *ro*, linguistically we should still have to consider the syllable *ar* as possessing the main stress because such would be the feeling of the speaker and interpreter. This again shows very emphatically that speech is more than a mere physical or physiological product, and that instrumental methods, which are able to analyze only the latter, are absolutely inadequate if we wish to understand the socio-psychological phenomenon of speech. The truth of this statement could be illustrated by countless examples chosen at random from any phase of language. Here is one, taken from the phonetic system of the Dutch language, to which reference has been made elsewhere in a somewhat different connection. The objective pronunciation of the Dutch word *zakdoek* is [zagduk]; yet we have said that socially and psychologically the [g] sound is nonexisting in Dutch. Its occasional occurrence in a few sandhi positions is a perfectly unconscious assimilation, and the contradicting feeling of analogy is so strong that the actual [g] sound in [zagduk] is both intended

[22] *Cf.* pages 51, 181, 228. See also Meyer, "Ein paar phonetische Fragen," *Modern Language Notes*, Vol. VI (1903), pp. 137–41; Jespersen, *Phonetische Grundfragen*, § 132*ff.*; Van Ginneken, *op. cit.*, pp. 292–93.

and interpreted as [k]. The ordinary Dutch speaker thinks he pronounces [zakduk] and interprets his fellow speaker's pronunciation accordingly; only phonetically trained students are aware of the illusion.[23]

Linguistic Significance of Experimental Phonetics

Concerning this social and psychological aspect of pronunciation in a living language instrumental phonetics teaches us nothing; on the contrary, there exists a real danger that too much importance attached to mechanical methods will be misleading as to the true nature of linguistic facts. In an essentially semeiological system like language the social and psychological factors are at least as important as the physical and physiological ones. Linguists should beware of the intrusive insistence of certain experimental phonetists to encroach upon their specifically linguistic domain. The results of instrumental experiments are no doubt very valuable data for the linguist; they are able to raise many interesting problems and to suggest many plausible explanations. But the experimental phonetist's task ends with the examination of physico-physiological facts. It is the linguist's function to see of what avail these are for his specific analysis of language, what rôle they are to play in his interpretation of specifically semeiological processes.

Generally speaking, there are three points of view from which mechanically obtained data are interesting linguistically.[24]

1. *For the Foreign Student.*—First of all, for the foreign observer or student who is not familiar with a certain lan-

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[23] *Cf.* pages 38, 41, 105, 349.

[24] *Cf.* page 9. See also Giulio Panconcelli-Calzia, *Die experimentelle Phonetik*, pp. 135–45; P. W. Schmidt, "Was erwartet die allgemeine Sprachwissenschaft von der Experimentalphonetik?" *Jahresbericht der österreichischen Gesellschaft für experimentelle Phonetik*, 1914, pp. 9–21; Meinhof, "Der Wert der Phonetik für die allgemeine Sprachwissenschaft," *Vox*, 1918, pp. 1–62.

guage it is important to know where objective reality diverges from subjective intention and interpretation, in order that he may avoid transferring his subjective values into the foreign language. Indeed, in his own tongue certain conflicts between what is actually pronounced and what is subjectively intended or apprehended may be of no practical consequence because the same subjective interpretation is common to all representatives of the linguistic community and the conflicts themselves remain quite unconscious. In the foreign language, on the contrary, subjective interpretation may affect entirely different processes, and the discrepancies from objective conditions unconsciously current in one language may be felt as shocking disturbances in another.

2. *For the Historical Linguist.*—Then, the historical linguist will often find that unconscious objective processes are the slumbering germs that eventually develop into conscious realities. For instance, in Czech the initial stress accent is so general and widely spread that even where actual accentuation deviates from the general rule the subjective feeling still adheres to the belief of initial stress. Yet it often happens, especially in words of three syllables of which the first is short and the second long, that the latter has the main accent. If the number of these exceptional cases should increase so that the force of analogy now prevailing would be considerably weakened, the result might be a systematic and consciously accepted accentual shift under the influence of quantity. As a rule, psychologically recognized changes in language are preceded by a period during which they are current as more or less mechanical occurrences. Hence the study of unconscious objective divergences from subjective feeling may give us valuable information as to the possible course of future linguistic development. They allow us to hear the "grass grow." In America intervocalic [t], particularly when the preceding vowel is short and stressed, is very often pronounced like [d]. Thus, instead of [bɛtə]

(*better*), [hɔtə] (*hotter*), we hear [bɛdə], [hɔdə]; "They ought to be" is not seldom pronounced as [ðɛɪɔ·dəbi·]. Most speakers are not aware of this condition; their subjective belief is that they utter the voiceless stop. If, however, this automatic tendency were to spread, the voiced pronunciation might eventually become a subjectively accepted fact. The partial assimilation of voiceless sounds to voiced ones in intervocalic position is a very common occurrence in the history of languages. Before the change of Primitive Germanic [θ] into [ð], as shown in a word like Goth. *brōþar*, O. E. *broðor*, Mod. E. *brother*, was finally recognized by the speakers, there doubtless existed a period during which [ð] was objectively uttered while [θ] was intended and interpreted. Similarly, the consonantal shift described in Verner's law,[25] according to which breathed consonants became voiced when they were not preceded by the main accent of the word, must at first have been a primarily mechanical process which gradually became general and ultimately resulted in a consciously acknowledged condition. Reversely, the subjective feeling may prove to be more powerful than the physico-physiological facts and thus modify the latter. For instance, in languages with little centralizing stress, factors other than the dynamic accent, such as pitch, sonority, quantity, rhythm, etc., are apt to become particularly conspicuous and influential. Hence confusion as to which part of a word actually bears the main stress top is very easily produced. The original accentuation of Span. *yó, diós* was *ío*, with the crest upon *i*. But as Spanish developed a little centralizing accent, the greater sonority of *o* as compared with *i* caused the accentual top to be felt as lying on the more sonorous sound, and this feeling eventually resulted in the corresponding actual accentuation *yó, diós*.[26]

[25] *Cf.* pages 227, 239.

[26] *Cf.* Meyer-Lübke, *op. cit.*, I, pp. 526–27; See also on pages 178, 228 of this book.

In Italian, which possesses a more energetic stress accent, the original accentuation has persisted. German, whose dynamic accent is very strong indeed, first diminished the sonority of *o* by reducing it to indefinite [ə], and later monophthongized the diphthong into [i·] (*io* > *ie* > [i·]).

3. *For the Psychological Linguist.*—For the psychologist, and especially for the psychological linguist, it is highly interesting to know with what illusory facts the human being operates in speech and to study the causes of objective refraction and of linguistic change. Here too the aid of the experimental phonetist can be very useful. The following example is given by Panconcelli-Calzia.[27] In certain German dialects the German word *Schub* ('a push', 'a throw'), when isolated, is pronounced like [ʃu·p], that is, with an initial voiceless fricative; but in the combination *einen Schub*, used as a formular command among laborers who are to move or lift collectively a heavy load, its pronunciation is [aɪnɛnžúp], with a voiced fricative. The reason is that in such a command the vowel and the last consonant of the final syllable are considerably more stressed than normally, and thereby they concentrate upon themselves the greatest part of the articulatory and psychic energy; the corresponding loss in the intensity of the preceding consonant [ʃ] is manifested by its becoming voiced [ž]. The correctness of this theory was established experimentally by requesting various representatives of different dialects to pronounce repeatedly the same command with voiceless [ʃ] but a strong accent on [up]. In several cases the kymographic curves showed that although the persons intended to utter [ʃ], they actually pronounced [ž]. Hence in this case the objective refraction from subjective intention and belief was due to the strong dynamic accent of the immediately following vowel and consonant.

[27] *Cf.* pages 181, 227, 239, 275; also Konrad Hentrich "Zum Vernerschen Gesetz," *Beiträge zur Geschichte der deutschen Sprache und Literatur*, Vol. XLV (1921), pp. 300*ff.*; Panconcelli-Calzia, *op. cit.*, pp. 44–45.

Incidentally, this explains the action of Verner's law.[28] Here is another illustration. In Polish the traditional word accentuation is that the top lies on the penult. But in words of more than two syllables that which immediately precedes the accented one has often the same or even a higher pitch than the latter, and since the dynamic accent proper is not remarkably strong in Polish, the prevailing conditions of pitch give the impression that the main stress is borne by the antepenult instead of the penult. By establishing the relationship between pitch and stress instrumental methods are able to show the cause of the illusion created.

Foreigners' Misinterpretations

It is only natural that misinterpretations of phonetic and especially of accentual conditions are very numerous on the part of persons who listen to a foreign tongue. Such persons are likely to interpret the foreigner's speech according to the objective physico-physiological facts of the language spoken coupled with the subjective feeling prevailing in their own language. The upshot is a complete dislocation of the well-balanced subjective and objective stratifications characteristic of any particular language. An Englishman is likely to hear a strong dynamic accent on the root syllable of French words, and the Frenchman is inclined to hear a weak final stress in English ones. Students of living languages and dialects, whether recorded or not, cannot be too careful in disentangling the many knots presented to the innocent observer by the skein of subjective and objective facts of a strange tongue.

Singing Languages

In this connection we may mention the illusion, which is very widely spread, as to the reason why certain languages

[28] The same phenomenon can be observed in English: *póssible* (with [s]), *possέss* (with [z]). Compare also *dissólve, dissolútion.*

are found to be more musical, or rather more singing, than others. In the first place, it happens extremely seldom, if ever, that stress differentiation is completely absent in a language. Aside from the peculiar type of certain African dialects[29] thought of as practically ignoring dynamic accentuation, languages agree pretty generally in using stress as a distinct means of rhythmical alternation. The specific way in which they use it varies from language to language: here it is very strong, with or without a centralizing effect, there it is very weak. But languages that operate only with the musical accent, either separate from or combined with quantity, as a differentiating factor in speech are extremely rare. Hence the difference between more and less musical languages seems to be correlated to the relative importance and the interaction of dynamic and chromatic accent. Stress is the result of very complex conditions, among which loudness is by no means essential. The syllable with the principal stress may even be whispered, its energy being conditioned by psychic and contrasting emphasis and by muscular effort. Pitch accentuation, on the contrary, is essentially an acoustic differentiation characterized by clear audibility. Slight musical modulations are more easily apprehended than slight fluctuations in stress; but where the dynamic accent is very strong, the psychic attention is so exclusively concentrated upon it that even great intervals of pitch are not clearly observed. In order to realize the ups and downs of pitch it would be necessary either to diminish considerably the energy accent or to sever the two types of accentuation from one another.[30] Consequently it will be much easier to follow the musical curve of the word in languages with a weak dynamic accent than in others. That French is commonly considered more musical or melodious than English

[29] *Cf.* pages 165*ff.*

[30] This actually happens, for instance, in the so-called Swedish accent 2. *Cf.* Axel Kock, *Die alt- und neuschwedische Akzentierung.*

or German is by no means due to greater intervals of pitch from syllable to syllable; on the contrary, such intervals are much greater and more sudden in the latter two languages. But because of the weak dynamic accentuation prevailing in French, even slight musical intervals are more easily apprehended than considerably greater ones in English or German. Moreover, like stress, the syllabic pitch of French words is more even and uniform than that of the other two languages, and this feature also contributes a good deal to enhancing the musical impression produced by French speech. Objectively the musical flow is more varied and its range is wider in English and German; subjectively the modulations of pitch appear to be greater in French. It is not surprising to find that languages that are considered melodious almost invariably possess a weak dynamic accent with little centralizing effect, while in the others both stress and centralizing effect are much more pronounced. Nor is it to be wondered at that the musical character of a language or dialect is noticed chiefly by foreigners who are used to different interactions between pitch and stress.[31]

[31] *Cf.* Jespersen, *Lehrbuch der Phonetik*, p. 241.

CHAPTER V

CATEGORIZING IN LANGUAGE

Logical and Linguistic Categories Contrasted

Classification of Experiences

Our experiences are normally complex, that is, they are composed of a variety of elements which present themselves united and are interpreted as units. But by reason of their complexity it is possible for one experience to share some of its constituents with others and to be distinguished from the latter by more specific features. Thus, our actual experience of a tree embraces one particular tree, say, an apple tree, but it implies a certain size, shape, color, as well as properties of growth, maturity, decay, etc. Another experience of a tree is made up of elements partly similar to those of the first, partly different. Both trees have branches, foliage, roots; they both grow, mature, and die; but the first bears a certain fruit, the apple, the other does not. Further experiences reveal still other differences and common features of a still more general nature. Our mind then groups together what is common and disregards what is different; the common features are felt to be a unit which may serve as a classifier to all the specific experiences. Pines, oaks, willows, plum trees, cherry trees, etc., they all belong to the class or category *tree*. An increasing number of experiences will naturally multiply the variety of specific differences and reduce the number of common elements, which then become more and more general. The differences between a particular apple tree and a particular dog are greater than those between an apple tree and an oak; yet the dog and the apple tree too

have common characteristics, such as, for instance, the phenomena of vegetative life, according to which they are classified as *living beings*. And so our groupings become wider and wider, and we may imagine a classifier of such generality as to include all actual and possible experiences. This abstracting and classifying activity is of the greatest importance for the development of human knowledge and civilization. Without it we should move in a chaotic world of scattered facts irreducible in their concrete individuality and progress would be made quite impossible. The use of abstracted coefficients allows us to organize the world of our experiences and thus to find our way out of the bewildering multiplicity of things and events.

Scientific and Instinctive Classifying

The process of classification presupposes the ability to reflect upon one's experiences. While this ability is common to all normal human beings, it presents a great variety of degrees and can be developed to more or less high stages of perfection. But reflection is not necessarily conscious. We constantly interpret signs and group our interpretations according to common characteristics unconsciously abstracted. The average person's behavior and actions are almost always based upon mental classifications of which he is not aware. However, we may also set ourselves consciously to analyzing what occurs and searching for more and less general classifications. Such is the method of science and scientific research. Categories are then formulated, and this formulation adds considerably not only to their clearness, but also to their productive usefulness for the development of further analyses and constructions. To be sure, conscious classifying may be arbitrarily conducted and directed toward some practical aim; we may, for instance, file words or names alphabetically according to their initial letters or sounds. This sort of pigeonholing, however, is

obviously not based upon a qualitative analysis of the things or events examined and is unscientific. The kind of classification that is aimed at in science naturally follows the laws of objective conditions and logical thinking. As such it is in no way identical with the unconscious or instinctive grouping that responds to the needs of psychic and social life.

These two classifying processes have to be carefully kept apart as their resulting categories do not necessarily coincide. According to conscious and scientific categorizing, the whale does not belong to the class of fish; according to popular and instinctive classifying, which is adequate for the needs of practical life, it does. Abstracting common experience elements and grouping them consciously and scientifically is, therefore, altogether different from examining which classifications are actually made by the unconscious and popular process in any particular manifestation of individual or social life. In the former case the light in which the experiences are placed and analyzed is the light of reason; if this be fundamentally the same for all normal human beings, the resulting classifications will be fundamentally the same for all people; if, moreover, reason be able to reach the truth, the ensuing categories may be said to reflect faithfully and objectively the actual organization of the world. On the other hand, the light in which the experiences are instinctively classified is that of practical life, which undoubtedly diverges from logical thinking to a high degree. Practical life is made up of reactions of the entire human organism to physical, physiological, psychic, logical, and social conditions. Since most of these are different from place to place and from time to time, practical categories which owe their origin to such changing conditions must needs be divergent. Logical categories are not only formulated, but also discovered and built up by logicians; practical categories may be formulated by the scientific observer, but they are evolved and used by the human being

inasmuch as he has to cope with physical and social surroundings. In one case the object of the thinker's activity is to classify things and facts; in the other he has merely to see which experiences have been and are actually classified and how. Logical categories are to extend to all actual and possible experiences, even to those of logical and practical categorizing; practical categories extend only to such experiences as require organizing for the purposes of the practical life of the individual or a group of individuals. Logical categories are inclusive, general, universal, immutable, homogeneous; unconscious categories are more particular, changeable, and heterogeneous. If we assume that clear thinking is possible independently of language or that thought can move easily outside of the medium of a certain linguistic form, it should not be insurmountably difficult to establish a set of logical categories which would be universally recognized as the supreme and ultimate forms or modes of existence of all things in nature. They would be the most extensive classes into which things could be distributed or to which the objects of thought could be reduced. Aristotle distinguished ten of them; but it is debatable whether his philosophy was not influenced by the language he spoke and whether his categorial table would have been the same had his mother tongue been Chinese or Greenlandic instead of Greek. As a matter of fact, other philosophers have found different sets of categories.

Whatever one may think about this matter, it remains a fact that the failure to distinguish between logical and instinctive categorizing has been responsible for many misconceptions in regard to language. Since thought is expressed and communicated through the medium of language, it was believed that the classifying predicates valid in the logical world would be found in language also. Hence, early grammarians influenced by Aristotelian and Scholastic philosophy admitted the existence of ten linguistic cate-

gories. Grammar was long considered an annex to logic, and even today the artificial edifice of logical grammar has not been definitely destroyed.[1] It still happens that our modern languages are taught in the same terms as Latin grammar was in the Middle Ages. A considerable difficulty in the modernization of grammar is no doubt due to the old nomenclature which we inherited from Scholastic grammarians and for which no acceptable substitute has yet been found. But to a certain degree the responsibility rests upon the shoulders of teachers and grammarians themselves; their linguistic foundation is often rather shaky and their attitude too theoretically dogmatic.

Linguistic Classifying Unconscious and Practical

The classifications that are found in and inferred from linguistic structure and molding are unconscious and practical, not logical. They are instinctively made and used, with the result that they facilitate the organization of the linguistic material and thus create a suitable system of signs for individual expression and social transaction. It is not the grammarian's task to posit a category and then to look for its equivalent in the language concerned. He should only disengage and formulate from the empirical speech material the general classes into which the forms and modes of the particular language can be distributed. Linguistic categories are ideal semanto-phonetic patterns, instinctively experienced by the average speaker, deduced by him from the current language, and utilizable as devices of analogical multiplication and reproduction of linguistic forms. Thus in Latin we shall have such categories as the noun, the adjective, the adverb, the preposition, the verb, gender, number, tense, modality, etc., because they all find a generally characteristic symbolization in the language.

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[1] *Cf.* page 203.

Systematic Speech Different from Systematic Thought

Logical and linguistic groupings are bound to diverge. The system of sounds and meanings is essentially distinct from thought itself which it is supposed to express. In language we have to take into account the acoustically and physiologically phonetic aspect, the psychic process of meaning, the social aspect of interpretation and communication, all of which are perfectly extraneous to the thinking process as such. The laws which govern the phonetic, the psychic, and the social conditions of language are essentially different from those which govern thought. By the action of these specifically linguistic laws effects will result which are far from being logical. Once language is constituted, it provides us with a system of forms and syntactical combinations whose mechanism allows us to play with them even in the complete absence of thought. The latter, then, may or may not come to be formed as a result of the interpretation of a purely linguistic combination. This has been cleverly described as follows: "Suppose someone to assert: 'The gostak distims the doshes.' You do not know what this means; nor do I. But if we assume that it is English, we know that 'the doshes are distimmed by the gostak.' We know too that 'one distimmer of doshes is a gostak.' If moreover the 'doshes' are 'galloons', we know that 'some galloons are distimmed by the gostak.' And so we may go on, and so we often do go on." [2] An examination of almost any metaphysical treatise would yield staggering heaps of illustrations. But aside from the sins committed in this respect by the professional thinker, no speaking community can afford to resist the temptation of using the linguistic devices of multiplication and reproduction beyond and against what reason would permit. It might be said that

[2] *Cf.* C. K. Ogden and T. A. Richards, *The Meaning of Meaning*, pp. 130–31.

from a logical point of view qualities can present various degrees of realization in the world of things. Thus, a house may be high, higher, or very high, etc. But by thus expressing a seemingly logical category linguistically, the language develops a system of adjectival comparison which can be extended mechanically.

The effect of analogy is perhaps the most pervasive and powerful in linguistic development. In English, adjectival comparison is expressed in two different ways: by means of the suffixes *-er*, *-est*, and by means of the systematical construction *more* plus adjective or *most* plus adjective. We can apply the mechanism so obtained to such an adjective as *perfect*, although what is perfect cannot logically be subject to degrees. In Iroquois, which has no category of adjectival comparison,[3] such a concept of varying degrees of perfection would not be likely to develop. Again, although the English language cannot claim to possess a linguistic category of abstraction, because the linguistic devices for its symbolization are too many and too diverse to produce the feeling of a special classification, yet some of the means of abstractive symbolization are sufficiently productive to allow the "force" of analogy fair play. For instance, by logical abstraction we form the concept of substantivated blueness, linguistically symbolized by means of the adjective *blue* plus the nominal suffix *-ness*. The same suffix is extensively used in similar cases so that it constitutes a form by which the incremental reference of abstractness is frequently symbolized. It can be used in connection with other adjectives, or even with other kinds of words (compare *together-ness*), although the corresponding concept does not necessarily

[3] Likewise Bantu lacks systematic degrees of comparison for adjectives. Thus, in Congo the sentence "That one is the better of those two chairs" is expressed by saying "The chairs, these two, that one has excelled in goodness." In Herero "I am greater than he" = *Ami omunene pu ye*, which is literally "I am great next to him." *Cf.* J. F. van Oordt, *The Origin of the Bantu*, p. 14.

exist or only follows in the wake of the symbol. In this manner the multiplication of abstract concepts and words is greatly facilitated. In languages that have not developed such a device of wide applicability logical abstractions of substantivated qualities are rendered more difficult. In Iroquois there is no way of expressing such abstractions by means of a systematic process of symbolization. In order to say "the blueness of the sky" the Iroquois native must use a paraphrase like "how the sky is blue."

How true it is that linguistic categories are the result of forces other than logical ones is still more clearly brought out by the following example. Logically and objectively there is a fundamental difference between the referential aspect symbolized by the phrase "I look" and that symbolized by "I see." In the former we have an action performed by the subject; in the latter we have a perception resulting from a retinal modification by which the subject is "affected." Objectively the referential aspect of "I look" is active, whereas that of "I see" is passive. Yet linguistically both symbols belong to the category of active verbs. In Indo-European languages the linguistic device of active conjugation has been so widely generalized, not as the result of logical classifying but as the effect of purely linguistic factors, that we even use it in such symbols as "I suffer," "I undergo," "I am," "I become," "I die," "I happen (to be at home)," etc. This situation so deeply affects our thinking that, except in altogether too obvious instances, the average person will impulsively assert an action on his part when as a matter of fact he is simply the subject of a state or affective condition such as seeing, hearing, suffering, dying, etc. Moreover, by a mere linguistic manœuvre we can turn a passive or affective condition actively symbolized into an action passively expressed. In the process symbolized by "I am seen by you" or "I am heard by you" the linguistic subject of the passive con-

struction is objectively active, while the linguistic object is objectively passive. This is particularly clear in the latter example. In order to be heard I have to act positively by producing a sound or noise, whereas he by whom I am heard is passively affected by my action. Still more illogical is the extension of the active conjugation to such uses as "This material feels soft," "The door opens," "The curtain rises," etc. It will not do to say that here we have verbs used intransitively. Even if we should grant the possibility of a logical definition of transitive and intransitive, we shall look in vain for its realization in language. By no metaphysical subterfuge is it possible to explain why a Frenchman or German should "obey" intransitively while the Englishman does it transitively (German *gehorchen* and French *obéir* are intransitive verbs).[4] The point we wish to make is that in our Indo-European languages the same verbal form is used for actions as well as for passive states. This is by no means a necessity; it is simply a fact, due to the course of linguistic history. There are languages in which in this respect objective reality is more faithfully mirrored. In Georgian,[5] a Caucasian language, there are two types of verbal forms, one for the symbolization of actions, the other for that of affective states. Instead of saying "I hear" Georgians will say "Sounding is to me;" instead of "I hate" they will say "Hatred is mine," etc. In English, French, and German we have only sporadic and often inconsistent instances of this type of verbal use: thus, Engl. "It appears to me;" "Methinks;" Fr. "Il m'apparaît," "Il me semble;" Germ. "Es scheint mir," "Mich ahnt" ('I suspect'), "Mich friert" ('I am cold'), "Mir träumt," "Es gelingt mir" (the latter expression is in English "I succeed" and in French "Je réussis"). But in Georgian the two uses of the verb exist alongside each other as regular

[4] By transitive verbs we mean those which may have a direct object.
[5] *Cf.* page 414.

and systematic verbal forms; although they do not meet logical requirements in every point, they are, however, a fairer approximation to objective conditions than the occasional instances met with in Indo-European.[6]

Diversity of Language Functions

Thus far we have shown that linguistic forms which supposedly follow closely the lines of thought necessarily drift away from logic, because systematized language is essentially different from systematized thought. The same conclusion is reached if we insist upon the diversity of the functions of language. Except in scientific terminology it seldom happens that linguistic signs are pure referential symbols. Their referential, emotive, and socially promotive functions are continually blended, and the categorizing in language follows the entwined zigzag lines traced by this mixture of functions. Thus, the category of gender, which exists in so many languages, though by no means in all, owes its origin possibly to a subjective feeling or appreciation on the part of the language-making community. In order to show that gender does not correspond to natural sex or to some other objective condition, we need not look beyond our own Indo-European languages. The gender of Latin nouns is different from that of the corresponding French, Spanish, or German ones. In German *Person* ('person'), *Waise* ('orphan'), *Wacht* ('guard'), *Memme* ('coward'), *Geisel* ('hostage'), are feminine, whereas *Kunde* ('customer'), *Dienstbote* ('servant'), *Kamerad* ('comrade'), *Kerl* ('fellow') are masculine, regardless of sex. *Drohne* ('drone') is feminine and *Weisel* ('queen bee') is masculine! In the sentence "Die Marie ist der Liebling des Vaters" the word *Liebling* is masculine simply because the suffix *-ling* has been generalized as a means of forming masculine nouns. Similarly,

[6] *Cf.* F. N. Finck, *Die Haupttypen des Sprachbaus*, pp. 132*ff.* See also Antoine Meillet and Marcel Cohen, *Les langues du monde*, p. 344.

the diminutive suffixes *-chen* and *-lein* always entail the neuter gender, no matter how logical or illogical the result may turn out to be. Even the common German word for *girl* (*das Mädchen*) is neuter. It is impossible to say what the particular feeling or appreciation that gave rise to the category of gender at the beginning of human speech exactly was. It may have been a feeling of differentiation between strong and weak, living and lifeless, superior and inferior, noble and mean, etc. It is obvious that no two communities, or even the same community at different times, are likely to share exactly the same appreciation of the things and events they experience. In Iroquois there are two genders, which might be called the noble and the mean. The former is characteristic of word symbols referring to men and good spirits; the latter is that of the symbols referring to women, male and female animals, evil spirits, and lifeless things. Chechen, a language of the North-East Caucasian group, knows as many as six genders of nouns. Each one is characterized by one or two consonants, which are pre-, in-, or suffixed to adjectives, demonstratives, verbs, nouns, numerals, etc. It is the purpose of these consonants to establish the agreement of such words with the nouns to which they are syntactically related. Aside from the masculine and the feminine, the genders represent no semantic category; that is, nothing in the nature of meaning appears to form the basis of classification.[7] Moreover, it is due to linguistic factors that gender differentiations often persist in a language long after the need for such a category has disappeared. In German they are still very much alive, in English they have been more and more restricted; yet outside of language the Germans feel no more the need of considering a table as masculine, a door as feminine, and a book as neuter than the English do. In English, linguistic factors have con-

[7] *Cf.* page 413; also Meillet and Cohen, *op. cit.*, pp. 328–29, 331.

curred in reducing the ancient three forms of the definite article to one and in cancelling the agreement of adjectives with nouns; the linguistic forces that have influenced German have tended to preserve both these features. Hence the difference between German and English in regard to gender.

Another category that is based upon a certain attitude of man toward the world is that of singular and plural. It may be claimed that they are merely two aspects of the objective category of number. But the idea that things should be divided into single and plural ones is perfectly arbitrary. Indeed, there is no plausible reason why number one should be given one class to itself while all the remaining numbers should have to share the other class. Even in English we have sporadic signs of other classifications, as may be seen in words like *both*, *pair*, *couple*, *brace* ("a brace of ducks"), *dozen*, *score*, *gross*, etc. In Primitive Indo-European, from which English descends, a regular classification was reserved to duality as well as to singularity and plurality. There were special singular, dual, and plural forms of the noun, pronoun, and verb. As a result of various circumstances the dual has been absorbed by the plural.[8] Originally a special need was probably felt for singling out duality on the same footing as singularity and plurality; but gradually this need was weakened and eventually extinguished, so that the way was smoothed for the disappearance of the dual form. It should be observed, however, that the loss of the dual as a category was not simply due to the vanishing of the need for it. Had it not been for linguistic developments favoring its elimination, the dual might have lingered much longer. One of such favoring circumstances was in this instance the following. If in a predicative or attributive construction of two or more words, one expressed duality in itself (for example, the numeral *two* or *both*, etc.),

[8] The result is, of course, that the meaning of the plural is changed.

the other could easily do without agreeing by means of a characteristic form.[9] The use of the words *two* and *both* exerted their influence upon the fate of the Indo-European dual in very much the same way in which the use of prepositions favored the disappearance of the genitive and other cases in French and, to a large extent, in English. Does that imply that the need for the distinction between one, two, and more than two has disappeared or diminished? Of course not; only this distinction, as far as duality is concerned, is now expressed by all sorts of implicit and explicit processes not sufficiently recurrent to cause a categorial feeling to subsist.

Linguistic Categories and Concepts

Their Lack of Correspondence

It is a very common practice among linguists to speak of categories in terms of concepts. That this terminology is at least confusing may be gathered from the following considerations. If we examine two concepts x and y based upon two sets of experiences with different common elements, we find that they are absolutely irreconcilable until we reduce them to a common denominator. If we do this, we obtain a new concept whose connotation is narrower and whose denotation is wider but which lacks precisely those connotating features which are specifically characteristic of the two more particular concepts x and y. If we wish to deal, for instance, with the x concept without neglecting its specific x character, we can do so only by relating it to more particular concepts in which at least all the x features are present. Now there is one feature that is common to all linguistic facts: they are all semeiological. Hence, in the connotation of all linguistic concepts must be included a dual aspect, one symbolic and one

[9] *Cf.* Karl Brugmann, *Kurze vergleichende Grammatik der indogermanischen Sprachen*, § 527.

semantic. For it should be stressed that a linguistic concept is to be understood as one based upon and derived from linguistic experiences. It is by no means synonymous with a nonsemeiological concept expressed in speech. The nonsemeiological concept of time is not modified by the fact that it is symbolized in spoken language or not; it is perfectly independent of the various possible modes of expression. The symbol *time* merely refers to the concept, and the linguistic experience resulting from the combination of this reference and its symbol is not a concept but a word. The concept of tense, which is derived from specifically linguistic facts, cannot possibly be declared of the same type as that of time. Nonsemeiological and semeiological concepts are absolutely irreconcilable, unless we disregard the semeiological character of the ones or the nonsemeiological character of the others. But the conceptual common denominator then obtained is either nonlinguistic or linguistic according to the case.

The term *concept* was coined and generalized by philosophers and psychologists to refer to a certain phase in the process of cognition. Its introduction into the linguistic vocabulary has proved a source of the most harmful misunderstandings. Jespersen chooses the words *notion* and *notional* for extralingual concepts;[10] they have the distinct advantage of not being fraught with the ambiguity resulting from unscientific and indiscriminate application to heterogeneous facts. We may, of course, if we so wish, neglect the phonetic part of linguistic processes and compare their semantic part with a certain nonsemeiological concept. And that is what linguists usually do when they describe the various linguistic categories. But in so doing they often overlook that this separation is purely artificial; that if carried out consistently it would land us right in the midst of philosophy instead of

[10] *Cf.* Otto Jespersen, *The Philosophy of Grammar*, p. 55.

linguistics; that the structural character of the semantic part of a linguistic experience, even if we isolate it mentally, owes neither its existence nor its relationships exclusively to the world of nonsemeiological concepts. It is generally admitted that there is no causal relationship between meaning and symbol. Why should there be any causal connection between the structural character or the syntactical treatment of a linguistic symbol and the structural character or the syntactical treatment of its meaning? Suppose the gender of German symbols referring to human beings were to become so formal that nothing but convention or phonetic characteristics of the nouns would be the classifying principle, would the conceptual sex differentiation among the Germans thereby be affected in the least? Manifestly, the only result would be that the category of gender, from being at least partly lexical, would become entirely congruential.

It does not even seem essential that when man first began to speak, he should have grouped his manifold nonlinguistic experiences in the structural and categorial molding of his speech material. Entirely free sound combinations may have served for the symbolization of all he wanted to say. It seems rather more probable that the instinctive process of organization began only after the making of language had set in and after the free material had become too cumbersome to manage. But then his grouping may have been guided primarily, if not exclusively, by purely linguistic principles, such as analogical leveling. Even if we assume for a moment that his initial linguistic organization was based upon an analysis of extralingual experiences, the manner in which this work of abstraction was performed was neither conscious nor scientific. Which of the many aspects of his life experiences struck him as common and found expression in the organization of his rudimentary speech material depended entirely upon the specific way in which he happened to look at things and in which they affected him. Supposing that the

distinction between concrete objects and concrete actions dawned upon him soon after he attempted to refer to them in speech, there were many possible aspects of both objects and actions that could strike him as common and as convenient means of organization. The time of the action (present, past, future, etc.) may have seemed quite immaterial to him, whereas the recognition of such aspects as duration, repetition, intensity, etc., may have been more in harmony with his general characteristic behavior. The shaping and grouping of his speech material would naturally follow the lines of this particular way of reacting to his surroundings. Instead of tenses classifying the action according to the time at which it appeared to take place, his linguistic signs would have assumed forms classifying the action according to such other aspects as we have just mentioned. Not that it would have been impossible for him to refer to time; but because the temporal aspect did not appear so important, it would have found other means of symbolization than systematic ones of classification. Whereas the aspects of duration, repetition, intensity, etc., would have been rendered by stereotyped and regularly recurring variations of the action sign,[11] the aspect of time would have been symbolized by means of occasional speech signs not regularly affecting the action symbol itself. Similarly, his reaction to the experience of objects may have revealed to him as important certain common aspects which to our minds are absolutely unessential and categorially negligible. Some of the many possible distinctions are, for instance, those between strong and weak, noble and mean, living and lifeless, between persons and other beings, between male, female, and sexless, between small and large, individual and collective, beautiful and ugly, nearby and distant, inside and outside, organic and inorganic, or any mixture or accu-

[11] Many languages actually operate with such verbal forms, known by the German name of *Aktionsarten* (='aspects of the action'), instead of, or at the same time as, with tenses.

mulation of suchlike distinctions. Subiya, a language of South Africa, classifies all things into twenty-one categories regularly represented by twenty-one different prepositions. The indication of one of these categories constitutes the nucleus of the sentence to which everything else is to be subordinated.[12] And so we see that even though the classifying of primitive man's experiences in language be granted, it is impossible to reconstruct the conditions that influenced his particular way of categorizing. Conclusions arrived at by the study of children's speech are not valid since the child acquires its linguistic mold ready-made.

However ancient the linguistic records we possess, they always reveal a language apparently complete and the product of a long evolution. What were the original non-linguistic concepts upon which the grammatical categories of gender, tense, mode, number were based? They may not have been born from any concept at all; they may have emerged as the accidental product of primarily symbolic, that is, phonetic or morphological, comparisons, so that the interpretation of semantic structure and grammatical categorization only followed *a posteriori*. The popular mind may have seized the opportunity presented by these coincidences to use the conceptual interpretation as a normative factor in further developing the category. In this case, however, knowing which particular kind of concept is the guiding principle of a linguistic category teaches us nothing as to the relationship of conceptual and linguistic categorizing, since the latter is the result of purely accidental, that is, of nonconceptual, circumstances. Its interest is purely linguistic, inasmuch as it shows how and which symbolic features happened to supply the material for comparison and organization.[13]

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[12] *Cf.* Finck, *op. cit.*, pp. 46*f.*

[13] For various other theories of categorizing see J. J. A. van Ginneken, *Principes de linguistique psychologique*, pp. 65–67.

Artificial Projections of Thought into Linguistic Structure

It is both interesting and amusing to take stock of the concepts that an occasional psychologist or linguist finds it fitting to project into structural facts of language. Says Raoul de la Grasserie: "Toute phrase sous son action fait défiler devant nous tous les objets de la nature représentés comme des hommes ou des femmes. . . . S'il s'agit du soleil, c'est sous des traits mâles qu'il apparaît à notre imagination, l'article masculin l'a voulu ainsi, tandis que la montagne apparaît sous des formes féminines grâce à l'article qui l'accompagne. . . . si le fleuve a des traits virils pour notre imagination, on ne comprend guère que la rivière ait des traits féminins, mais il en est ainsi."[14] Jespersen in his *Philosophy of Grammar* protests against what he calls a certain kind of "national psychology" according to which structural habits in the language of a people are attributed to alleged national idiosyncrasies. Thus he quotes Deutschbein, who in his *System der neuenglischen Syntax* expresses the view that the use of the Saxon genitive in English expressions of time points to the important rôle that time plays in the consciousness of the English people; and that the use of the accusative with the verb *to help* as compared with the dative in connection with the corresponding German verb suggests a dynamic character ("Grundcharakter") of the English people as opposed to a more static one of the Germans.[15] It seems hardly believable that such fantastic interpretations could be made by scholars who obviously are not ignorant of the pervasive part played in linguistic symbolization by the action of analogy and phonetic history.[16]

[14] Raoul de la Grasserie, "De l'expression de l'idée de sexualité dans le langage," *Revue philosophique de la France et de l'étranger*, Vol. LVIII (1904), p. 228.

[15] *Cf.* Jespersen, *op. cit.*, p. 187.

[16] *Cf.* page 190. Compare also what John Stuart Mill says: "It

"Grammatical Concepts"

Generally speaking, however, the inadequacy of the single term "concept" for the discussion of language categories has been recognized, and judging from its success the coining of the expression *grammatical concept* as a suitable substitute seems to have met with the approval of many outstanding linguists.[17] In reality, this hybrid symbol leaves altogether too much to the guessing imagination of the conceptually inclined interpreter. We have already insisted that it would be entirely arbitrary to say that the gender of Latin or German nouns reflects any concept at all, except perhaps where it coincides with actual sex differentiation. Even in the case of *femina*[18] ('woman') it can be maintained that the concept of sex is not systematically symbolized by the *-a* ending. If it were, we might be justified in saying that the same concept is symbolized by the same ending in such a word as *mensa* ('table'). It would perhaps be more advisable to look for the symbolization of the concept of sex in the radical itself inasmuch as the latter means 'woman' and as we know from extralingual experience that the concept "woman" can be classified under the more general heading of sex. At any rate, in the great majority of cases gender is just a traditional and mechanical habit of nominal agreement and morphological treatment. Now from this we can, of course, abstract and construct the concept of grammatical

[grammar] is the most elementary part of logic. It is the beginning of the analysis of the thinking process. The principles and rules of grammar are the means by which the forms of language are made to correspond with the universal forms of thought. The distinctions between various parts of speech, between the cases of nouns, the moods and tenses of verbs, the functions of particles, are distinctions in thought, not merely in words. . . . The structure of every sentence is a lesson in logic. . . . In these qualities the classical languages have an incomparable superiority over every modern language. . . ." Etc., etc. See John Stuart Mill, *Inaugural Address to the University of St. Andrews, 1867*, Peoples' ed., pp. 15, 16.

[17] See, for example, Edward Sapir, *Language*, Chap. v.

[18] *Cf.* pages 148*ff.*

gender, and it would be justifiable to dub this a grammatical concept. But instead of being reflected in language, such a concept is itself the reflection and abstraction of a linguistic condition. Grammatical gender does not conform to the concept, but the concept conforms to grammatical gender as it happens to exist in a language at a particular time. Similarly, if we consider the plural form of a verb like Germ. *sie schlagen* ('they beat'), it can hardly be maintained that the plural ending *-en* reflects a concept of plurality of the action. The action is singular; those who act are plural. The concept of plurality may be said to be reflected in the pronominal form *sie*, but not in the form of the verb. Like gender, the plural of German verbs is just a habit of agreement and morphological treatment. Verbal forms reflecting the concept of plurality occur, but in many languages they are more or less isolated formations not resulting from such regular grammatical processes as would give rise to the existence of a productive category. In English a number of verbs with the prefix *re-*, such as *re-write*, *re-ship*, or a few frequentatives of the type of *cackle*, *babble*, *stutter*, *chatter* imply repeated actions. But on the whole the plural of the verbal idea is symbolized in English by such free paraphrases as "He used to walk," "He is in the habit of walking," "He talks and talks," or by means of various adverbs. There are other languages in which the plurality of action is regularly symbolized by a grammatical process affecting the verbal form in a systematic way. In Iroquois almost any verb can be made iterative by means of a morphological modification consisting of the amalgamation of some particle containing the *s* sound with the basic verb: thus Iroq. [wakenākwēs] = 'I am angry', [se-wakenākwēs] = 'I am angry again'; [kehiāras] = 'I remember', [s-kehiāras] = 'I remember again.' Similarly, in Russian *chitát'* = 'to read', *chítyvat'* = 'to read off and on'; *kolót'* = 'to prick', *kályvat'* = 'to prick continually'; *biegat'* = 'to run', *biegyvat'*

= 'to run again and again'; *valjáť* = 'to roll', *vályvat'* = 'to roll repeatedly', etc.[19]

Description of Linguistic Category

Semantically Categories Are Incremental References

Since, then, it is impossible to solve in terms of concepts the problems suggested by linguistic categories, since they are not to be considered as counterparts of logical ones, we must ask: If linguistic categories exist at all, what are they and how can they be ascertained in a given language? In the foregoing paragraphs it has been made clear that they are above all practical classifying patterns of which it is an essential feature that the things classified are not thoughts but semanto-phonetic facts. Hence the basis of classification must be supplied by common elements or aspects of both a semantic and a phonetic character. Semantically they must be referential increments modifying references of a more fundamental character. This modification may be without any regard to syntactical relationship; it may be of such a nature as to relate the modified reference to other syntactical parts of the sentence; it may be such as to indicate the congruential togetherness of one word with another; or it may be a modifying combination of two or all of these aspects.

Classification of Categories

Accordingly we can divide the categories into (1) *lexicological*, (2) *syntactical*, (3) *congruential*, and (4) *mixed*. The categories of special kinds of words such as nouns, verbs, adverbs, adjectives, conjunctions, etc., are purely lexicological; those of the subject, attribute, and various object cases are

[19] *Cf.* Lowe, *Systematization of the Russian Verb*, XXVI, XXVII; also Ferdinand Sommer, "Das slavische Iterativ-Suffix *-vati*," *Indogermanische Forschungen*, Vol. XI (1900), pp. 202*ff*. The letter *t'* means here a palatalized *t*.

purely syntactical. The category of time, or rather of tense, is usually mixed: the temporal aspect of a verb may modify the verbal reference without any regard to the syntactical structure of the sentence, as, for instance, in the isolated words "He worked," "He sang," etc.; or it may relate the verbal reference to some other part of the sentence, as in "He told me he *was* a lawyer." Similarly, the categories of plural and gender are likely to be mixed. Inasmuch as the gender of a noun is felt to express the sex or some other typical characteristic of the nominal referent, it is lexicological; where it does not, or where it forms an incremental aspect of an adjective reference, it is congruential. The category of plural is lexicological in isolated nominal references such as *fathers, apples*, etc., or in verbal references implying a repeated action such as the Iroquois frequentative verbs; it is both lexicological and syntactical in so far as it relates certain nominal references to others or to verbal ones in the sentence; it is congruential in nonfrequentative verbs or in adjectives, for instance, in Germ. *sie schlagen, schöne* (*Kleider*). Furthermore, the syntactical and congruential categories are closely related: the fact that a referential aspect indicates the togetherness of one word with another implies that both words are used in the same syntactical function or that they are somehow subordinated to one another.

Phonetic Requirements

Phonetically the symbolization of the various categorial aspects may take the forms of derivational parts in morphological words; that is, the phonetic symbolization of categories may consist of affixes, radical modification, or accentual differentiation. An additional means of categorizing in language is the use of individual words generally called *auxiliaries*. The temporal aspect of verbs is often symbolized by auxiliary words such as *have, shall, will* in English, *haben,*

sein, werden in German. The remaining methods require perhaps a special justification to be listed here, because they might be objected to on the ground that they are not phonetic. For the first of them consists precisely in the absence of any positive phonetic symbol. For instance, the English noun *dog* is characterized as singular by the absence of the suffix [-z] (spelt as -*s*); the German adjective *schön* is felt as a positive by reason of the lack of either the comparative or the superlative suffix -*er*, -*st*. But just as in a musical melody pauses are no less significant than tones, in language the absence of a sound or sounds may have a distinctive semantic value. In itself the lack of sound is, of course, absolutely meaningless and nonphonetic; but if the presence of a certain phonetic element is systematically contrasted with its absence so that there results a corresponding contrast of meaning, we are entitled to call such absence a phonetic feature of language. It is not phonetic in the sense that it is positively represented by a sound; but it may be termed phonetic in the broader sense that it belongs either to the systematical or to the rhythmical process of phonetic symbolization. If the endingless English noun *dog* were not systematically contrasted with the expanded form of the plural, *dog-s*, the lack of ending might not mean anything. In the word *mouse* the absence of a nonradical element is meaningless since the contrasting plural *mice* is equally endingless. The want of sound may be called a phonetic feature because it derives its meaning from the contrasting presence of sound in a systematically related form. This type of categorial symbolization is especially frequent in languages that are more analytical than synthetical, as are our Western European languages of today. A still more striking instance of apparently nonphonetic symbolization is supplied by the plural of a word like *sheep* in English. In the sentence "Do you see those sheep?" it is undoubtedly classified as plural although there is no phonetic difference between this form

and that of the singular. But on the one hand the word *sheep* systematically clusters with all the other representatives of the class of nouns whose singular and plural are characterized by a contrasting absence and presence of ending; on the other hand the plural aspect of *sheep* finds its phonetic expression in the congruential form of the adjective *those* in the sentence. Hence, syntactical congruence and systematical togetherness are to be considered as auxiliary means of categorial expression. Then, there is the possibility of a systematized grammatical treatment. The word *greatness* is sufficiently marked as a noun by the nominal suffix *-ness*, but the word *cut* lacks any particular sign of a lexicological classification. If, however, we apply a suitable grammatical treatment to the word ("the cut," "my cut," "he cuts," "cutting"), its categorial membership becomes quite clear. Finally, the mere position of the words within the sentence or phrase may be categorially significant. In two sentences like "Your father likes my son" and "My son likes your father" the syntactical relationship of *your father* and *my son*, as that of the subject to the object in one instance and that of the object to the subject in the other, is exclusively symbolized by their respective positions with regard to the verb. This type of symbolization is particularly common in languages without any or with only few morphological words, for instance, in Chinese and to a large extent also in English.

Necessity of Uniformity of Semantic and Phonetic Recurrence

We may conclude, then, that the common elements according to which linguistic facts are categorially classified must be interpreted as referentially incremental in respect of references which are in turn interpreted as more fundamental, and that these increments must be linguistically symbolized, though not necessarily in the form of nonradical elements. But that is not all; the question still left to be answered is:

To what extent and in what sense is it necessary that the incremental semanto-phonetic elements be common in order to engender the general feeling of a specific linguistic category? For instance, incremental abstract references contrasting with concrete ones are not at all uncommon and can be very well symbolized in English. Various phonetic devices may serve the purpose: affixation, with or without radical modification, as in *great-ness, father-hood, dea-th, free-dom, beau-ty, spiritual-ity, subject-ion, friend-ship, high–height, may–might, see–sight*; the substantivation of adjectives, as in *the beautiful, the ugly, the good*; etc. The referential abstract aspect is common to all these instances and countless analogous ones, and from a conceptual point of view we are certainly in the presence of a category (or subcategory) of abstractness as opposed to concreteness. Why is it that we do not recognize in English a corresponding linguistic category? The reason appears to be that from a semanto-phonetic point of view the same element does not recur with sufficient uniformity. In the first place, most of the symbolic devices illustrated above are also used to indicate a concrete referential aspect, as may be readily gathered from examples like *many kindnesses, a witness, a falsehood, a brotherhood, a kingdom, a construction, a dominion, hardships, a fellowship, a scholarship, utilities;* and secondly, the variety of symbolic means is so bewildering that a feeling of linguistic categorization fails to emerge. To be sure, no absolute uniformity of recurrence is required as regards both the semantic and the phonetic side, but these two features must present themselves to the speakers' consciousness with the character of entailing a well-balanced resultant of uniform recurrence. Sometimes the feeling of uniformity will persist chiefly on account of constant phonetic regularity in spite of considerable referential scattering; sometimes it will be due primarily to constant referential recurrence in spite of phonetic variations. Let us take as an example the category of number in

English. Referentially the singular symbol may symbolize a plural aspect: compare the expressions *five dozen, three score, five foot nine, five stone, more than one week*; reversely the plural symbol may symbolize a singular aspect: compare the form of the personal pronoun *you*, the plural of majesty *we* instead of *I*. Besides, the plural aspect of nominal references may present a great many varieties, such as the normal plural: *horses* = 'one horse plus another horse plus a third horse, etc.'; the distributive plural: "*Cats* have four feet" (= 'Each cat has four feet'); the inclusive plural: *we* = 'I plus you plus he or they'; the exclusive plural: *we* = 'you and I', etc. But not only are these varieties of plural aspects generally felt to be somehow related to each other on account of common features, they are in addition symbolized by phonetic signs recurring with a considerable degree of uniformity. It is true that the plural symbols may be [-s] (*cats*), [-z] (*fathers*), [-ɪz] (*houses*), [-ən] (*oxen*), radical change (*mouse–mice*), mere congruential agreement (*sheep bleat, those people*). But in the first place the signs [-s], [-z], and [ɪz] are really interpreted as one; secondly, the referential plural aspect is felt to be the same in all the nominal types—*cats, fathers, houses, oxen, sheep, mice*; thirdly, their syntactical treatment is analogous—they all entail a verbal form in the plural; and finally, the symbol [-s] with its sandhi varieties is characterized by its extraordinary productiveness, which places the other devices decidedly in the shadow. The final upshot of these semanto-phonetic conditions is that in the minds of the speakers the feeling of uniformity of recurrence distinctly prevails. Hence the category of plural is linguistically alive in English.

No General Criterion Available

It goes without saying that it is impossible to give a general criterion whose application would allow us to determine exactly how many and which are the linguistic categories

recognized in a given language. In many instances the relative uniformity of recurrence is counterbalanced by relative differentiation to a degree where the emergence of a distinct linguistic category becomes very doubtful. Categorial referential aspects are always of a considerably abstract nature, so that the number of linguistic experiences required for the isolation of a distinct category must needs be very great. The analysis of these numerous experiences and the determination of what they are found to have in common is extremely complicated and has to follow different methods in keeping with the idiosyncratic character of each individual case. Beside clear-cut categorial classifications each language has a certain number of doubtful ones. Everybody agrees that the singular and the plural are generally recognized categories in English; but the same certainty can hardly be said to exist in regard to the subjunctive or to the durative aspect ("I am working") of verbal references. Nor should we be surprised to find that categories are not all realized with the same distinctness in a given language. The past tense is more clearly categorial in English than the future, because the symbolization of the former is systematically morphological whereas the latter is symbolized by means of auxiliaries which are also used in other functions (for example, "He shall work," "I will go"). Generally speaking, it may be said that the categorial feeling is more readily engendered when the common symbol of the referential aspect is a derivational element than if the symbolization is obtained through other devices, and that it increases with the degree of uniformity of semanto-phonetic recurrence and with that of systematic productiveness.

PART II

DRIFT AND DIVERSIFICATION

CHAPTER VI

PHONETIC CHANGE

The Facts of Phonetic Change

Individual Speech Differences

It is a matter of common knowledge that those members of a relatively homogeneous group who are not linguistically trained pay very little attention to the speaking process as such. Unless extraordinary peculiarities are present in a person's speech, hearers and speakers are primarily, if not exclusively, aware of what is being spoken, while the manner in which it is said largely remains below the horizon of conscious observation. Not only do most of the differences in other persons' speech pass unnoticed, but one's own changing characteristics in the use of language are generally unconscious. We are so accustomed to registering and grouping together as practically equivalent various acoustic and semantic impressions that as long as certain limits of variability are not exceeded, we recognize only collective units instead of individual or successive divergences. Yet these divergences are always present, and they may become supraliminal at any time because of various reasons, such as deliberate attention and analysis or purely accidental impulses. The number and the nature of the existing individual differences will then be consciously perceived with the more accuracy the more keenly our sense of linguistic discernment has been developed.

Group Languages

Speech discrepancies are more numerous and more evident in proportion as the speaking community is less homogeneous

with respect to the forces that influence language. Society, as we know, does not consist only of individuals, but of social groups of greater or less coherence according to common interests, occupations, relationships, etc. The more exclusive such groups are, the greater the probability that each of them possesses a common stock of speech peculiarities of which the members of other groups will be distinctly aware.[1] In every large community with a common language there can be found a number of so-called "group languages" characterized by more or less salient features. In this sense we may speak of languages within a language, such as, for instance, "business English," "Negroes' English," "rogues' English," various forms of English slang, etc. Moreover, foreigners who have acquired the language of the community in which they live seldom succeed in assimilating it to such a degree of perfection that the ordinary range of unobtrusive speech variability is not exceeded.

Static and Historical Differentiation

The linguistic differentiations referred to result in a mosaic picture. In terms of time they may be called simultaneous, in terms of space, horizontal. Their presence escapes the conscious observation of the average speaker only when they are minor individual idiosyncrasies within the same homogeneous community group; otherwise the most prominent of them are consciously apprehended, because they are in a sense horizontally contiguous and can, therefore, be empirically compared and contrasted. They are characteristic of language considered as a static vehicle of social intercourse. Strictly speaking, it is true, speech is never simultaneous, since it is essentially an activity resulting in a succession of significant sounds, and it is not without importance that this feature be kept always in mind. But because at any given time speech

[1] *Cf.* E. Oehmann, "Sprachentwicklung und Milieu," *Neuphilologische Mitteilungen*, Bd. 28 (1927), pp. 75–89.

is governed by a system of relatively static laws, we are justified in studying and analyzing different temporal cross sections of language and in opposing static differentiations to historical ones. The latter are such as are revealed by comparing the linguistic facts of historically different periods within the same traditional language or dialect. They are not found juxtaposed in one relatively static layer, but are superposed in different strata. In terms of time they are successive, in terms of space they are vertical. In order to observe them it is necessary to reconstruct past layers by various methods. If we compare the English of the 14th century with that of today, we find that M.E. *win, fif, wif, lif, striken, ripe,* in which *i* represents a monophthong, correspond to Mod. E. *wine, five, wife, life, strike, ripe,* where *i* stands for a diphthong. The expression "linguistic change" is often confined to historical or successive differentiations, while simultaneous and relatively static ones are considered as mere transitional stages which may or may not lead to more general and lasting conditions. Historical changes are also termed secondary, in contrast with the static or primary ones. It is easy to see, however, that the distinction between the two types is more apparent than real, as the different periods or historical layers in the development of a language can be defined only in an arbitrary way. It would be perfectly legitimate to reduce the length of such periods to a minimum, that is, to consider the language of a large community or of a secondary group or even of an individual at one particular moment and to compare it with that of an immediately following or preceding moment. Linguistic change there would doubtless be, but so slight that it would be practically unobserved. There is no period of which it could be said, "here language has reached a finished form." Language is in a continuous flux. There are times and circumstances of numerous and rapid modifications; there are others of comparative stagnation. If an octogenarian could

hear himself as he spoke when he was ten years old, he would probably notice a certain number of more or less striking peculiarities. Linguistic differences between grandfather and grandson are readily realized by the untrained observer. As to differences in speech from individual to individual or from social group to social group, they too are identifiable as linguistic change inasmuch as they are, in a way, successive and influence each other. And so we see that a descriptive and an historical study of language are distinguishable only as representing two methodological points of view. In a sense all language is change; in another it is a relatively static system.

Recorded and Unrecorded Languages

It is hardly necessary to remark that a language can be studied historically only if it has been recorded at various periods in the past. Unfortunately, a very large number of languages and dialects were never written, or at least have not transmitted any documents, and so can be examined only in their static form in so far as they are still alive. The longer the written tradition of a language, the more extensive and accurate our knowledge of its history may become. In many respects the investigator of an unrecorded living language is in a better position to understand all its secrets than, let us say, a student of Sanskrit or Oscan-Umbrian, who has no opportunity to hear spoken the language under study. The interpretation of records from a linguistic point of view is a very complicated procedure. From a mere examination of the English language as it is written today it would be utterly impossible to form a picture of its sounds and rhythm. In order to interpret written symbols as to their phonetic value it is necessary to resort to critical comparisons of many of their forms and combinations, of preceding and following periods, of related dialects and languages; to a careful study of loan words, of metrical conditions, of scattered phonetic

descriptions or suggestions, of the process of phonation, etc. In this way it may be possible to draw a good many plausible inferences as to how a language was actually spoken, but such a picture will always remain considerably less perfect than one that is obtained from empirical acoustic experience. Besides, languages were not always and many were never so unified as our modern European languages, with respect not only to their spoken forms but also to their written symbolization. Hence we always have to reckon with the recorder's dialectal and individual peculiarities and with his system of spelling. On the other hand, the existence of a long series of documents affords us an historical perspective of the greatest value. Not only do they allow us to infer much of the phonetic character of a language at the various periods from which records are available, but by the study of archaic features, by formulating the general and specific tendencies that have directed the historical changes that can be witnessed, by a comparison with other related languages likewise recorded, by applying the principles of physiological and psychological phonetics, our inferences may even penetrate far beyond the time of the earliest attempts at permanent symbolization. Thus it has become possible to reconstruct with varying degrees of probability a large number of features of Primitive Indo-European of which we have no records.

Various Kinds of Phonetic Change

As might be expected, there is no feature in language that is absolutely final or free from change. Hence a methodological distinction is suggested between phonetic, accentual, morphological, lexical, semantic, and syntactical change. The first of these, namely, the change of sounds, has received by far the lion's share of the attention and interest of linguists. The reasons are not far to seek. Sounds are more palpable entities than meanings and syntactical relations and conse-

quently lend themselves to a more exact scrutiny. Since changes of sounds naturally affect also the words and word forms in which they occur, morphological and lexical developments often appear as mere results or corollaries of phonetic modifications. Moreover, whereas the transformations of words, word forms, meaning, and syntactical symbolization seem to be extraordinarily recalcitrant to synthetic formulation, phonetic changes more readily satisfy the desire for generalization, so that the coining of the term "phonetic laws" was naturally prompted by the facts. Indeed, many sound changes are found to be carried more or less consistently through the whole lexical material of a language. A classical example is furnished by the so-called Germanic sound shifts. The Indo-European tenues, that is, the voiceless stops, *p*, *t*, *k* became in primitive Germanic the voiceless spirants, *f*, *θ*, *χ*(*h*). Compare Lat. *pēs*, Goth. *fōtus*, O.E. *fōt*, O.H.G. *fuoz*, O. Icel. *fōtr* ('foot'); Lat. *pecu*, Goth. *faihu*, O.E. *feoh*, O.S. *fehu*, O.H.G. *fihu* ('cattle'); Lat. *trēs*, Goth. *þreis*, O.E. *þrī*, O.S. *thria*, O. Icel. *þrīr* ('three'); Lat. *frāter*, Goth. *brōþar*, O.E. *brōðor*, O.S. *brōthar*, O. Icel. *brōðir* ('brother'); Lat. *canis*, Goth. *hunds*, O.E., O.S. *hund*, O. Icel, *hundr*, O.H.G. *hunt* ('dog'); Lat. *cor*, Goth. *haírtō*, O.E. *heorte*, O.S. *herta*, O. Icel. *hjarta*, O.H.G. *herza* ('heart'). Where this change has not taken place, it is often possible to show that the conditions under which it was prevented were also quite consistent and regular. Thus, in the Indo-European combinations *sp*, *st*, *sk* the tenues are regularly preserved, no matter in which word they occur. Compare Lat. *spuere*, Goth. *speiwan*, O.E., O.S., O.H.G. *spīwan* ('to vomit'); Lat. *hostis*, Goth. *gasts*, O. Icel. *gestr*, O.E. *giest*, O.S., O.H.G. *gast* ('stranger'); Lat. *piscis*, Goth. *fisks*, O.E., *fisc*, O.S., O.H.G. *fisk*, O. Icel. *fiskr* ('fish'). Changes that are found with great regularity throughout the whole or a considerable part of the vocabulary of a language are called *constitutive* or *organic*. Others, which are represented

only in one isolated or a few stray words, often in contrast with an otherwise organic change of the sound concerned, are known as *sporadic*. For instance, Latin free e^2 of the unaccented initial syllable became in French [ə]; compare Lat. *fenéstra*, *venire*, *levâre* with Fr. *fenêtre*, *venir*, *lever*. But in a few words it has been changed into [y], as may be seen from Fr. *buvant*, *fumier*, which were in Old French *bevant* and *femier*.

From another point of view, a sound change may appear either to depend upon the nature of its surrounding sounds or to be independent of them. The Latin velar [k] (spelt as *c*) in initial position before *e* or *i* has become in French [s] by a partial assimilation to the following front vowel; compare Lat. *centu*, Fr. *cent*; Lat. *cervu*, Fr. *cerf*; Lat. *cera*, Fr. *cire*. These are *conditioned* sound changes, also called *dependent* or *heteronomous* because they appear to depend upon the extraneous influence of their phonetic surroundings. On the other hand, the fact that M.E. [i·] has become diphthongized to Mod. E. [aɪ], as, for example, in M.E. *wīn* > Mod. E. *wine*, seems to be caused by the internal character of the sound itself irrespective of its environment. It is a so-called *spontaneous* or *autonomous* change. Furthermore, if we consider two distant stages in the evolution of a sound, we may find that the transformation has occurred *gradually*, with various intermediate stages. M.E. [i·] before reaching its modern pronunciation as the diphthong [aɪ] went through such gradual forms as [iɪ], [eɪ], [əɪ], [aɪ]. Modifications of this character are often contrasted with more *sudden* ones, for instance, the so-called cases of epenthesis, where a new sound is added in the body of a word (compare Lat. *tener* with Engl. *tender*), or of dissimilation, where one of two identical or similar sounds in a word is dissimilated from the other (compare O. Fr. *livel*, Mod. Fr. *niveau*), etc.

[2] A vowel is said to be "free" when it is followed by only one consonant or by one of the consonantal groups *tr*, *dr*, *pr*, *br*, *ns*.

In all the illustrations thus far given we have been in the presence of processes which in a sense are mechanical, that is, which are apparently influenced by factors of a physiological character, whether extraneous or inherent to the sound affected. So-called *mechanical* sound changes are opposed to *analogous* ones, the latter resulting from a psychic association between various linguistic forms and their meanings. Latin free accented *a* before a nasal eventually became [ɛ] (spelt as *ai*) in French, while unaccented initial *a* remained intact. Hence Lat. *ámo* > Fr. *aime*, whereas Lat. *amámus* should have given Fr. *amons*. The fact that we now say *aimons* is due to the analogy of the singular forms with [ɛ] (spelt as *ai*).

Classes of Changes not Clearly Distinguishable

Again and again distinctions and classifications which appear theoretically very clear have been found to flow into one another by gradual differentiation when it comes to practical and empirical cases. In this instance, too, a critical examination of the above classes of phonetic change reveals that a sharp distinction between them is out of the question. In the first place, the regularity of so-called constitutive changes is due simply to the fact that the conditions important for their genesis are fulfilled in a great many words. But the modification of *e* into [y] in Mod. Fr. *buvant* < O. Fr. *bevant* and in Mod. Fr. *fumier* < O. Fr. *femier* is just as consistent and organic as the more frequent one of *e* to [ə] if only we take care to describe the genetic conditions more fully. By saying that Vulgar Latin free unaccented initial *e* preceded and followed by a labial is transformed into [y], we account for the phonetic status of Mod. Fr. *buvant* and *fumier* in terms of regularity and organic consistency. The more numerous and complicated the genetically essential conditions are, the fewer will be the probabilities of realization. Unless we confess that a mere numerical distinction of

frequency is intended by the terms "constitutive" and "sporadic," it is hard to see how a clear line could be drawn. But a distinction based exclusively upon the number of cases realized seems not only arbitrary, but perfectly sterile and useless. Likewise, the least that can be said of the terminology that contrasts spontaneous or autonomous changes with conditioned or heteronomous ones is that it is unfortunately chosen and may give rise to the most erroneous conceptions. There is no such thing as a spontaneous or autonomous sound change. A phonetic shift is always conditioned, at least partly, by certain circumstances extraneous to the sounds as such, but whose existence or nature it may not be easy to ascertain because of our own deficiencies or the hidden complication of the phenomena to be analyzed. Nor does there seem to be any distinct division between gradual and sudden modifications. In one sense every linguistic change is sudden, in another it is gradual. The fact that M.E. [i·] did not become [aɪ] at once is quite true; nevertheless each pronunciation diverging for the first time from the original monophthong [i·] was a sudden change inasmuch as it had never existed before. It matters little that such an initial divergence was perhaps imperceptibly small, for the difference between "small" and "great" is merely one of degree, not of nature. Each phonetic stage in the evolution of a sound, once it has become more or less general, has a static and current value and is not felt as a transition eventually leading to another change. Today the original M.E. [i·] is pronounced [aɪ], but nobody knows what it will be two or three hundred years from now. Assuming that it will be monophthongized to [a·] or [e·], we should be obliged to call our present [aɪ] pronunciation a mere transitional stage in the shift from M.E. [i·] to [a·] or [e·]. Strictly speaking, there is no justification for contrasting certain stages as final with others as transitional. It is not even possible to distinguish between what is a perceptible change and what is not. We

have already insisted that each language allows a certain scope of variation for every sound but that in this respect there is no agreement whatsoever from language to language. A difference which is perfectly unnoticed and immaterial here may be essential and significant elsewhere.[3] However, each phonetic change is gradual in so far as it is psychically prepared by the interaction of various hereditary or associative tendencies. In this sense the principle "Natura non facit saltus" is applicable to language. But the formulation of these tendencies is extremely difficult. It is also true that the spreading of a diverging pronunciation over a certain area is often gradual, namely, when it is effected by the process of imitation. Finally, mechanical and analogous changes cannot be kept apart as two incompatible species. Except in abnormal cases, a phonetic change is never purely mechanical; if it were, a sound could change only as a result of an involuntary modification of the physiological and physical conditions of production. We all know that we can effect such a modification of our own free will. Besides, a speech sound is always part of a system characteristic of a given language, and systematizing is essentially a psychic operation. Nor can it be maintained that the force of analogy is extraneous to all so-called mechanical changes. Of this we shall submit suggestive evidence in our discussion of phonetic law and analogy later in this chapter.[4]

Change of Articulatory and Auditory Bases

There are certain features a change of which affects more or less the entire phonetic system of a language. They are the bases of articulation and audition and the accent. The *articulatory basis* is generally described by phonetists as the

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[3] *Cf.* pages 39, 40*ff.*, 178.

[4] *Cf.* Hugo Schuchardt, *Ueber die Lautgesetze*, p. 56; Otto Jespersen, "Zur Lautgesetzfrage," *Techmers Zeitschrift*, Vol. III (1887), pp. 188–217.

peculiar position of the various parts of the speech organ when at rest. This neutral position is different in different languages and is the result of both hereditary and acquired habits. An Englishman who is to speak French must first succeed in effecting a general transposition of his neutral basis of articulation, by giving his tongue a more forward position, by keeping his lips in readiness for frequent rounding and his tongue for tenser articulation, etc. The *auditory basis* is the fixed grouping of sounds in collective acoustic units (= phonemes) comprising a number of meaningless variations; or, to put it differently, it is the conventional appraisal of the bounds within which the acoustic identity of certain variations is felt to be preserved in a given language. It is the basis from which the speakers of a language identify various acoustic shades as unimportant variants or as significant and essential phonetic differences. In English the acoustic identification of a sound such as voiceless [p] is dependent upon its accurate differentiation from voiced [b], whereas in Middle and Upper German dialects [p] and [b] are acoustically identified as the same collective sound unit.[5] These bases of articulation and audition are at the same time the effect and also the preserving cause of the particular sound system of a language, and it is easy to see how a change in one is likely to produce a corresponding change in the other and to affect more or less the whole system of sound grouping. Both are by no means immutable. They are especially subject to shifts in the event of language mixture. When an Englishman speaks French, he is very prone to pronounce it with his English basis of articulation and to identify the French sounds in keeping with his English basis of acoustic discrimination. The French word *Jean* is pronounced by Germans [ʃaŋ], where French [ʒ] and [ɑ̃], which do not occur in the German sound system, are replaced by

[5] *Cf.* page 34.

their closest German approximations [ʃ] and [aŋ]. It is quite clear, therefore, that considerable inroads into the phonetic system of a language may be expected when a whole people adopt the language of another people. The bases of articulation and audition of the two languages will influence each other, and the resultant will be a compromise in which the relative rôle and importance of each depends upon many circumstances. It has been maintained that the Spanish spoken in Chile is essentially Spanish with the sounds of the aboriginal Araukan language; that the presence of cacuminal dentals in Sanskrit is due to its mixture with Dravida; that the Germanic sound shifts are the result of a mixture of Indo-European with non-Indo-European dialects; that Spanish [h] corresponding to Latin [f] is accounted for by the influence of Iberian or Basque; that French and, perhaps, Dutch owe their autonomous [y] sound to their Celtic predecessors.[6] Although it is very difficult to give conclusive evidence to support the suggested explanation of these facts, it seems beyond doubt that linguistic mixture is responsible for many of those puzzling upheavals in the sound systems of languages. On the other hand, however, it is no less true that the bases of articulation and audition may also be shifted by gradual modifications of the individual sounds as the result of causes to which we shall refer later.

Change of Accentuation

Accentuation too is a feature so pervasive that its change entails far-reaching phonetic transformations. The history of sounds usually follows entirely different channels according as they carry the main accent of the word or not. A whole set of sound changes, such as diphthongization, monophthongization, syncopation, gemination, assimilation, dissimilation, loss, addition, and others, are often directly

[6] *Cf.* pages 262, 274, 362. See also J. H. English, *The Alternation of H and F in Old Spanish.*

traceable to accentual conditions. The so-called Indo-European ablaut phenomena, consisting of a regular gradation of vowels, of which there are many traces left in the forms of English strong verbs and other derived words (compare *sing, sang, sung, song*), are probably due to differences in accent. The contrast of the medial consonants in the German words *Vater* and *Bruder* is conclusively shown to result from the fact that the Indo-European ancestor of the word *Vater* had the accent on the second syllable whereas the original of *Bruder* had it on the first (Verner's law)[7]. That the accentuation in a language does not escape the general law of evolution is a fact with which every etymologist has to reckon. We know that in Indo-European it was primarily musical and free, while in many of its later developments it became fixed and dynamic. In Primitive Germanic it was still free, as is evident from the action of Verner's law; subsequently it became fixed on the initial stem syllable. Vulgar Latin had a strong dynamic accent which coincided roughly with that of Literary Latin but which in due time became little centralizing and final in Modern French. Again, ethnical mixture is advanced as a circumstance favorable to relatively sudden innovations in the accentual habits of a linguistic community. The Germanic initial accent is sometimes explained as the result of a compromise between Indo-European and non-Indo-European accentuation on Primitive Germanic territory. A curious example of this influence of one language upon another is found in the German dialect of the Swiss canton of Valais, whose accentual features are claimed to resemble those of its Romance neighbors. But there are many other factors that may lead to accentual shifts. In French the tendency to drop the unaccented syllables has resulted in preserving only those which had either the main or a secondary stress top, so that today

[7] *Cf.* pages 182, 239.

there is little alternation of accented and unaccented syllables. That this tendency is still very strong is instanced by the pronunciation of such an expression as "Qu'est-ce que c'est que ça?" which becomes [kɛs·ɛksa]. Whatever stress there is left is final, because everything that followed the accented syllable in Vulgar Latin was gradually eliminated. Moreover, we have seen how the conflicting objective and subjective accents may influence each other and eventually be followed by systematic alterations. The pitch, the relative sonority, the quantity of a syllable, a slight shift of the accentual crest, may cause the stress to be felt as lying somewhere else than where it was traditionally assumed to lie, so that the initially illusory accentuation becomes in the course of time actually realized as the traditional one; compare the accentual change of original *ío* into Spanish *ió*.[8] It has been shown to be a common Slavonic law,[9] still operative in Lithuanian today, that if a syllable with rising pitch is followed by one with falling intonation, the latter takes over the accent of the first. The explanation is that the intonation tops of the two syllables come to be contiguous and under the influence of the musical top the stress too is shifted so as to straddle the two syllables. From this slight shift to a distinct displacement the way is not very long. Similarly, if the difference between the main and the secondary accent of a polysyllabic word is not very marked, the resulting confusion often causes the accentual seats to be interchanged. This explains, for instance, the accentual interchange in German *vórzüglich* and *vòrzűglich*. That rhythm is responsible for displacing the accent has been observed before. Sentence rhythm, it is true, causes only occasional modification;

[8] *Cf.* pages 178, 181.

[9] Compare Hermann Hirt, *Indogermanische Grammatik*, V, *Der Akzent*, pp. 170*ff.*; Antoine Meillet, *Mémoires de la Société de Linguistique de Paris*, Vol. II, pp. 346*ff.*; Meillet, *Le Slave commun*, pp. 144*f.*; Wenzel Vondrák, *Slavische Grammatik*, I, p. 197; Ferdinand de Saussure, *Indogermanische Forschungen, Anzeiger*, Bd. 6, pp. 157*ff.*

but it happens that words that are frequently used in certain combinations adopt the occasional rhythmical accentuation as the normal one.[10] Inasmuch as rhythm is operative in word composition and derivation, it naturally results in a lasting accentual transposition. Compare the accent of Engl. *consíder* and *cònsidərátion*; of Germ. *Lándsmann* and *Làndesháuptmann*. Furthermore, emphasis may exert a modifying influence. In French it is usually the first syllable beginning with a consonant that is more energetically stressed when the word is emphasized; examples are, *mísérable, párfaitement, absólument*. In words whose meaning is normally superlative or intensive such emphatic accentuation is likely to become a stable feature, which accounts for the current pronunciation of French *épóuvantable, absólument, beáucoup, húrler*, etc. A further cause of accentual change is analogy. A foreign word introduced into a language is mostly submitted to one of the patterns of accentuation prevailing in the borrowing language; the French, who have adopted the English word *gentleman*,[11] pronounce it with final stress. But analogy may also affect the accent of indigenous words, provided the language concerned uses more than one accentual pattern. In German the following patterns coexist normally: *Wittenberg* and *Wittenbérge*; *Ínnsbrück* and *Saarbrücken*. The first words of these two sets have the initial Germanic accent; the second ones have a normalized rhythmical accent. Hence by analogy with the latter the Germans also pronounce *Osnabrück, Donauwörth, Reichenáu*, etc.[12]

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[10] Jespersen mentions an interesting example: "Der Kartenspielterminus, französisch 'carreau' hiess ursprünglich bei uns 'karó', jetzt aber, nachdem die proklitische Form (Káro tre, usw.) die andere verdrängt hat, immer 'káro'."

[11] *Cf.* Paul Passy, *Etude sur les changements phonétiques et leurs caractères généraux*, p. 119.

[12] *Cf.* Karl Luick, "Emphatische Betonung als Quelle neuer Wortformen," *Englische Studien*, Bd. XII (1927), pp. 17–25.

More Specific Phonetic Changes

Aside from these two fundamental changes, there are numerous others of a more specific and particular type, all of which are interesting objects of study for the specialist but whose very nature compels us to a mere enumeration of the most important varieties among them. Besides, in a way they may all be said to depend upon the more general and pervading shifts described above.

Vocalization.—Vocalization is the change of a consonant into a vowel. Thus, in English the *o* of *swallow* is a vocalization of *w* (< A.-S. *swealwe*); the *i* of *brain* is a vocalized *g* (< O.E. *braeg(e)n*); in Dutch and French *l* is very often vocalized, as may be seen from such words as Du. *oud* (= Engl. *old* = O.H.G. *alt* = O.S., O. Fri. *ald* = A.-S. *eald*) and Fr. *peau, beau*, etc., < Lat. *pellis, bellus*, etc.

Diphthongization.—Diphthongization is the development of a diphthong, which may be caused or favored by various conditions. The diphthongs in English *house* and *ice* are the result of a gradually progressing differentiation of originally long vowels (compare A.-S. *hūs, īs*); in Engl. *brain* < A.-S. *braeg(e)n* the vocalization of *g* has resulted in the diphthongal [eɪ] sound; in Dutch the [eɪ] of *peinzen* ('to think' = Lat. *pensare*) is conditioned by the following [n] plus a dental. A peculiar kind of diphthongal differentiation known by the name of *vowel-breaking* was extremely frequent in the Old English dialects of the South (West Saxon and Kentish). Before a consonantal group beginning with *r, l*, or *h* the two vowels *a* and *e* became respectively broken to *ea* and *eo, io*. Thus O.E. *wearm, feallan, heord, seolfor, seox, feohtan, eahta, healf, liornan* = Mod. E. *warm, fall, herd, silver, six, fight, eight, half, learn.*

Monophthongization.—The reverse process is that of monophthongization. The diphthongal *ou* sound of M.E. *douhter, brouhte*, which itself was a diphthongization of O.E.

ō, became in Modern English [ɔ·]. Compare our modern pronunciation of *daughter* and *brought*. Middle Germ. *uo* in *muoter* became *u* in Mod. G. *Mutter*.

Lengthening and Shortening of Vowels and Consonants.—Lengthening and shortening of vowels and consonants are other frequent types of sound change. They take place under the influence of a great many circumstances, such as accent, position, phonetic surroundings, syllabication, etc. In the history of both English and German we notice a decided tendency of accented vowels to lengthen in open syllables and to shorten in closed ones. Thus Mod. E. (*to*) *keep* < O.E. *cēpan*, but Mod. E. *kept* <O.E. *cēpte*; Mod. E. *sleep*, but *slept*; *leave*, but *left*. Compare also *shepherd* and *sheep*, *wisdom* and *wise*. Before *nd*, *i* and *u* were lengthened and later diphthongized in English, as in (*to*) *wind* < *windan*, (*to*) *find* < *findan*, *hound* < *hund*, *ground* < *grund*, etc. Applied to consonants, lengthening is called *gemination*.

Assimilation.—Assimilation consists of one sound being either totally or in part made similar to another. It is nothing but a stabilized form of sandhi. Examples are extremely numerous in all languages. The assimilating force may act in a progressive direction, as in Lat. *collis* < *colnis*, or in a regressive way, as in Lat. *intellego* < *interlego*, or in both directions at the same time, as in Skr. *labdha* < *labhta* (= 'taken').[13] Total assimilation is found in Lat. *collis* and *intellego* or in Engl. *gossip* < *godsibb*, *gospel* < *gōdspel*, whereas in the English word *count* < Lat. *comp(u)tare* [m] has been only partially assimilated to [t] by becoming dental [n]. Similarly, in the words *tense* < O. Fr. *tens* < Lat. *temp(u)s*, *daunt* < Lat. *dom(i)tare*, *aunt* < Lat. *am(i)ta*, *hemp* < *henep*, we have examples of partial assimilation. Furthermore, the sounds that are subject to assimilation may be contiguous or distanced from one another. In the

[13] H. G. C. von der Gabelentz, *Die Sprachwissenschaft*, p. 199.

illustrations thus far given the former case is realized; in Fr. *chercher* < *cercher* (Middle Lat. *circare*) or *camarade* < *camerade* (compare Lat. *camera*) or *airain* < O. Fr. *arain* < Middle Lat. **aramen*, we have examples of the other type. Progressive assimilation at a distance is also found in the phenomenon of vowel harmony[14] so current in Finno-Ugric languages, by which the vowel of the stem determines that of the suffix; thus, Manchu *alaha* = '(I) have told', but *genehe* = '(I) have gone', *toktoho* = '(I) have arranged.'[15] On the other hand, the so-called umlaut or vowel mutation is a regressive assimilation of distanced vowels. The vowel of one syllable is modified under the influence of that of an immediately following one. In the West Germanic languages it is very widely spread, although in their modern word forms the inducing vowel is usually no longer present. The most powerful influence was here exerted by *i* or *j*, as may be seen from innumerable examples in English and German. When an accented *a*, *o*, or *u*, long or short, was followed by an *i* or the semi-vowel *j* in the succeeding syllable, they were partially assimilated by becoming in some degree palatal like *i*. This accounts for the alternation of vowels in such English words as *man–men*, *foot–feet*, *mouse–mice*, *gold–gild*, *brood–breed*, *full–fill*. In O.H.G. we have *gast* (= 'guest') in the singular but *gesti* in the plural; *tragu* = 'I carry' but *tregis* = 'you carry'; *kraft* = 'force' but *kreftig* = 'powerful.' Also, the vowels *a*, *o*, and *u* often caused a mutation of preceding vowels. Thus, the ending of the past participle of strong verbs in Old High German was *-an*; the ablaut vowel of the stem in the verb *biotan* (= 'to offer') was normally *u* in the past participle (**gibut-an*); but the influence of the suffix vowel *a* caused *u* to be lowered in the direction of *a*, so that the actual past participle turned out to be *gibotan*. The modifying or induc-

[14] *Cf.* pages 150, 332*f.*
[15] Von der Gabelentz, *op. cit.*, p. 194.

ing vowel may even be separated from the modified or induced one by more than one syllable. The original form of O.H.G. *menigî* (= 'multitude') was *managî*, which first developed into *manegî* > *manigî*. When a velar or guttural sound becomes palatal by assimilation, the process is called *palatalization*. For instance, Lat. [k] (spelt as *c*) became [s] (spelt as *c*) in Fr. *cent* < Lat. *centum*; it became [ʃ] in Fr. *char* < Lat. *carrum*. Likewise, in English the initial affricate in the words *church, chaff, churl, chalk*, etc., is due to a palatalization of *k*. Compare the Scotch forms *kirk, caff, carl, cauk*. The change of a sound into [s] or [z] is designated by the more specific name of *assibilation*. The French nasalization of vowels is merely a partial assimilation to a following nasal consonant, which itself was eliminated in due time.[16] The phenomenon of assimilation is usually considered as a typical example of mechanical or physiological change: the position of the speech organ required for the formation of the inducing sound is said to be anticipated completely or in part while the induced sound is still being uttered. But to what extent this anticipation is mechanical and in what measure it is psychical is not easy to determine. In any case, it seems rather difficult to understand how a primarily mechanical procedure could explain assimilation at a distance. Here it is quite clear that the psychic anticipation of the acoustic nature of the inducing sound is the principal determining factor, and this stresses again the fact that between mechanical changes and analogical leveling the difference is gradual rather than fundamental.

Dissimilation.—Dissimilation takes place when of two similar sounds, either contiguous or at a distance, one is differentiated from the other. Thus, in Lat. *lapsus* < **laptus*, *fluxus* < *fluctus*; in Germ. *haft* < Lat. *captus*; in Du.

[16] See the speech curve on page 60.

ach(t)ste < *achtte*, the sounds concerned are adjacent, while in Fr. *rossignol* < *lossignol* (Lat. *luscinia*), *niveau* < *livel*, *pélerin* < *peregrinum*, *orphelin* < *orphanum*, *nappe* < *mappa*; in Engl. *marble* < M.E. *marbre*, *purple* < *purpur*, *turtle* < *turtur*; in Germ. *murmeln* < Lat. *murmurare*, etc., the phonemes subject to dissimilation are separated from each other by one or more other sounds. In immediate connection with this phenomenon has been shown to be the accent or rhythm:[17] the sound that is under greater rhythmical stress remains intact, while the one that is accentually handicapped is dissimilated. A special kind of dissimilation, which consists of the loss of one of two similar syllables, is called *haplology*. For instance, Lat. *nutrix* < **nutritrix*, *semestris* < *semimestris*, *stipendium* < *stipipendium*, *medialis* < *medidialis*; also Engl. *idolatry* < Lat. *idololatria*. Diphthongization, too, is only a type of dissimilation.

Addition and Loss of Sounds.—The addition and the loss of sounds may affect any part of a word, but in linguistic terminology a classification is made according as they occur initially, medially, or finally. Thus, when a sound is added at the beginning, as in Engl. *squeeze* < A.-S. *cwēsan*, *nickname* < *ekename*, the process is called *prosthesis*; when the addition affects the end of the word, as in Engl. *sound* < Fr. *son*, *earnest* ('pledge') < M.E. *ernes*, *against* < M.E. *ageines*, it is termed *paragoge*; when it happens in the body of a word, as in Engl. *cartridge* < Fr. *cartouche*, *corporal* < Fr. *caporal*, *slumber* < M.E. *slumeren*, *bridegroom* < A.-S. *brȳdguma*, it goes by the name of *epenthesis*. A loss at the beginning is called *aphaeresis* or *aphesis*: Engl. *lone* < *alone*, *squire* < O.Fr. *escuyer*, *bishop* < Lat. *episcopus*, *knife* and *write* in which *k* and *w* were formerly sounded; likewise, Fr. *La Guyenne* < *l'Aguyenne* < Lat. *Aquitania*, and in present-day popular speech *la pendicite* < *l'appendicite*,

[17] See Maurice Grammont, *La dissimilation consonantique dans les langues indo-européenes et dans les langues romanes.*

la cétylene < *l'acétylene.* The loss of a final sound, the so-called *apocope,* is very frequent in the history of Indo-European, and especially of English. Thus, all final *e*'s of Middle English have since been dropped, although modern spelling has often retained them, as in *more, mute,* etc. And finally, *syncope,* or the loss of a medial sound, may be exemplified as follows: Engl. *ant* < A.-S. *æmete, mint* < A.-S. *mynet* < Lat. *moneta, else* < A.-S. *elles, hence* < M.E. *hennes,* etc.

Metathesis.—Metathesis is the transposition of a sound within a word. The *r* sound seems to be particularly affected, as is shown from a comparison of Du. *borst, versch, dorschen, persen, torsen* with the corresponding Engl. *breast, fresh* (A.-S. *fersc*), *thresh* (A.-S. *therscan*), *press* and the French *trousser.* Engl. *through* was formerly *thurh, grass* was *gaers, horse* was in Old Saxon *hross* and is still in German *rosz, bird* was A.-S. *bridd.* Another sound which is pretty often transposed is *s.* Compare Engl. *wasp* < A.-S. *waeps, clasp* < M.E. *clapsen, hasp* < A.-S. *haepse, ask* < O.E. *āscian, ācsian.*

PHONETIC LAW AND ANALOGY

PHONETIC LAW

Misinterpretations of the Term

At first blush it would seem that the problem of phonetic laws is fundamentally the same as that of the causes of phonetic change, the difference being merely one of aspect or point of view. In current linguistic literature, however, the two are quite distinct. Since it first appeared in the nomenclature of the science of language, the term "phonetic law" has been subject to many interpretations. As early as 1826 Wilhelm von Humboldt spoke of "phonetic laws" as general tendencies and directions of linguistic events.[18] Con-

[18] *Cf.* Solomon Lefmann, *Franz Bopp,* III, p. 52.

sidering the comparatively limited data that were at his disposal, von Humboldt could apply the term only in a vague metaphorical sense. He used it rather because of a divining vision as to certain empirical drifts moving the forms and the system of language in definite directions. With this meaning the word "law" is often used in referring to the more or less distinguishable currents underlying the history of human events, though only by a stretch of the imagination can such tendencies be compared with the laws of nature. In the same way von Humboldt noticed in the various static and dynamic features of language a striking coherence and harmony which he compared with the unity and harmony in the system and growth of living organisms. There is no objection to such metaphorical language so long as it does not induce one to a literal interpretation. But under the pressure of many concurring circumstances what von Humboldt had intended as pure similes was gradually conceived of as relationships of actual identity. And so language came to be considered as a true living being, and the laws of sounds were identified with those of the physical and physiological world.

It seems strange that such an aberration of the mind should have come about and eventually affected the researches of an important array of linguists. But if we follow its growth from the time it first cropped up in the form of a bold metaphor to the period when it crystallized into a distinct formula and a scientific program, we find that it was merely the outcome of partial misinterpretations of a series of scientifically tested discoveries, namely, those of astonishingly regular correspondences in the phonetic history of languages. Ever since the natural sciences were born, their increasing importance and dissemination have nourished the desire to fill the chasm that separates the psychic and physical worlds from one another. Phenomena pertaining to the life of the soul have been more and more reduced to

chemical and physical processes. It is not only linguists who have mistaken certain regularities in the development of human activities for the expression of laws of the same type as those of nature. Psychologists and sociologists are continually endeavoring to reduce the element of arbitrariness characteristic of psychological and social occurrences, although their efforts are far from being always successful.

Phonetics in the Service of Etymology

In the study of language this element was extraordinarily prevalent before the formulation of phonetic laws. Etymologizing was simply based upon vague semantic resemblances and striking phonetic coincidences. The fitful etymologies arrived at in this manner could not but challenge the more scientific minds of the time. It is not surprising, then, that phonetics as a separate science originated and grew in the service of etymology. It was felt that speech sounds should be studied for their own sake, and emphasis was laid upon the physiological character of their production and reception and upon the physical aspect of their transmission. Furthermore, it was realized that while speaking we are not at all concerned with the manner of sound production, which is quite automatic. The inevitable inference seemed to be that the whole story of speech sounds could be told in terms of mechanical and physiological laws. This conclusion appeared to be confirmed by the discovery of most striking regularities in the history of sounds and by the recognition that sound changes are quite independent of meaning.

Formulation of Phonetic Laws as Laws of Nature

Franz Bopp (1791–1867) was still very hesitating and hazy in his terminology, but even in his works we find numerous expressions of the type of "organism of language", "language anatomy," "the mechanism, physics and physiology

of language,"[19] etc. The discovery of the famous Germanic and High German consonant shifts by R. C. Rask (1787–1832) and J. L. C. Grimm (1785–1863) left no doubt that certain transformations could not possibly be explained by pure chance. A. F. Pott's (1802–1887) etymological researches (1833–1836) were essentially based upon the principle of phonetic laws. Georg Curtius (1820–1885) speaks of the laws of linguistic decay as of natural laws,[20] and August Schleicher (1823–1868) goes as far as to classify the science of language among the natural sciences.[21] Indeed, Schleicher's exaggerated views were so extravagant that a reaction was inevitable. Whereas up to his time the regularity of linguistic change had been emphasized, especially in the older forms of language such as Sanskrit and Greek, with a view to reconstructing the Indo-European protolanguage, linguists of the following generations applied themselves more and more to the study of modern speech and dialects and stressed the many sporadic irregularities which could not be brought under any phonetic law. This was undoubtedly a change in the right direction, but by the irony of fate it only contributed to a closer elaboration and definition of the concept "phonetic law." For owing to a gradually improved understanding of linguistic processes, many baffling irregularities which seemed to invalidate or to weaken such laws as had been established were shown to be the outcome of other

[19] *Cf.* Franz Bopp, *Vergleichende Grammatik des Sanskrit, Zend, Griechischen, Lateinischen, ... Deutschen*, 2d ed., pp. vi, xii.

[20] *Cf.* Friedrich Müller, "Sind die Lautgesetze Naturgesetze?" *Techmers Zeitschrift*, Bd. I (1884), pp. 211–15; Ludwig Tobler, "Ueber die Anwendung des Begriffes von Gesetzen auf die Sprache," *Vierteljahrschrift für wissenschaftliche Philosophie*, Bd. III (1879); A. G. Wallensköld, "Zur Klärung der Lautgesetzfrage," *Abhandlungen Prof. Tobler dargebracht* (1895), pp. 289*ff.*

[21] *Cf.* August Schleicher, *Die deutsche Sprache*, 3d ed., pp. 119*ff.*; Schleicher, *Ueber die Bedeutung der Sprache für die Naturgeschichte des Menschen*; Schleicher, *Compendium der vergleichenden Grammatik der indogermanischen Sprachen*, pp. 1*ff.*; W. A. Streitberg, *Indogermanische Forschungen*, Bd. VII, p. 360; Johannes Schmidt, *Kuhns Zeitschrift*, Bd. XXVIII, pp. 303–12.

laws with equally regular action. Thus, according to the laws of Germanic consonantal shifting, Indo-European, Sanskrit, Latin, and Slavo-Lithuanian *d* was supposed to correspond to Greek *δ* and to Germanic *t* (High German *z*). But Gr. *θυγάτηρ* and Goth. *daúhtar* (O.H.G. *tohtar*) looked like an exception, since the word was in Sanskrit *duhitā*, in Zend *dughdhar-*, in Lithuanian *dukté*, in Old Bulgarian *dŭšti*. This exception, however, was eliminated when Graszmann showed that Skr. *duhitā* did not represent the original Indo-European consonantal conditions of the word, but that it itself had developed from Indo-European **dhuhitā*, and that Zend *dughdha* must have been originally **dhughdha*. Hence the laws which may be formulated as follows:

1. I.-E. *d* = Skr. *d* = Lat., Slavo-Lith. *d* = Gr. *δ* = Germ. *t* = H.G. *z*

and

2. I.-E. *dh* = Skr. *dh* or (under certain conditions) *d* = Zend *dh* or (under certain conditions) *d* = Gr. *θ* = Germ. *d* = H.G. *t*

are shown to be perfectly regular (Graszmann's law of deaspiration).[22] Likewise, in 1875 Verner formulated his law [23] which accounts for a great number of apparent exceptions from the regular Germanic sound shifts discovered by Rask and Grimm. How astounding the regularity of language changes were sometimes found to be may be gathered from the fact that "correlation between Lithuanian and Lettish is of such a nature that they can, to a very considerable extent,

[22] *Cf.* Hermann Graszmann, "Ueber das ursprüngliche Vorhandensein von Wurzeln," *Kuhns Zeitschrift*, Bd. XII, pp. 81*ff.* The law can be formulated as follows: If in Greek or Indic two consecutive syllables begin with an aspirate, one of the two, usually the first, loses its aspiration. (In our example the second syllable loses it.)

[23] *Cf.* pages 182, 227; also Karl Verner, "Eine Ausnahme der ersten Lautverschiebung," *Kuhns Zeitschrift*, Bd. XXIII, pp. 97, 130. Verner's law can be formulated as follows: The voiceless spirants of Primitive Germanic origin (*f*, *þ*, *h*, *s*) became voiced (*b*, *d*, *g*, *z*) when the Indo-European accent did not immediately precede.

be transmuted one into another by the observance of a certain set of phonetic correspondences"[24] and "that the Zend and the Vedic Sanskrit exhibit such regularity in their phonetic correspondences that not infrequently entire passages can be transferred from one to the other by the application of phonetic laws."[25] On the other hand, a good many sporadic anomalies were proved to result from some degree of linguistic mixture, and loan words were avowedly placed beyond the reach of regular phonetic change. Finally all those deviations which could not be ascribed to any mechanical law of sounds or to any sort of linguistic mixture were accounted for by the magic force of analogy. The latter, considered as a psychological agency based upon associations of meaning, was contrasted with the allegedly physiological mechanism of phonetic laws, and hence the dilemma "Sound changes are due either to phonetic laws or to analogy" was believed to exhaust all the possibilities of explanation. It implied the belief that phonetic laws tolerated no exceptions.

The Theory of Exceptionless Applicability

The theory of blind and exceptionless application was first expressed by Wilhelm Scherer,[26] although it was consistently carried out only a year later in August Leskien's *Declination im Slavisch-Litauischen und Germanischen* (1876). It became a slogan and a program adhered to with various

[24] *Cf.* August Leskien, "Lithuanian, Lettish and Prussian," paper read before the English Philological Society in 1878, pp. 3*ff.* (quoted by Maurice Bloomfield, *American Journal of Philology*, Vol. V, p. 181).

[25] *Cf.* Christian Bartholomae, *Handbuch der altiranischen Dialekte*, preface (quoted by Bloomfield, *loc. cit.*).

[26] *Cf. Preuszische Jahrbücher*, Bd. XXXV (1875), p. 107: "Die Veränderung der Laute, die wir in beglaubigter Sprachgeschichte beobachten können, vollzieht sich nach festen Gesetzen, welche keine andere als wiederum gesetzmäszige Störung erfahren." The same theory is thought by some to have been held by Schleicher, although he does not express this view unambiguously anywhere in his works. See *Kuhns Zeitschrift*, Bd. XXVIII, pp. 303–12, Bd. XXXII, pp. 419–20; also *Indogermanische Forschungen*, Bd. VII, p. 360.

degrees of conviction and consistency by a whole set of able linguists known by the name of Neo-Grammarians. Karl Brugmann in his introduction to the first volume of the *Morphologische Untersuchungen auf dem Gebiete der Indo-Germanischen Sprachen*[27] (1878) and Hermann Paul in his first edition of the *Prinzipien der Sprachgeschichte* (1880) were ardent supporters and defenders of the theory, and G. E. Sievers' *Grundzüge der Lautphysiologie* (1876) "placed carnal weapons in the hands of the insurrectos. Hostile criticism enough appeared. On the whole it was Prussia that appeared in array against Middle Germany, but the sharpest blows were struck from Austria and America by Hugo Schuchardt in his tractate *Ueber die Lautgesetze: Gegen die Junggrammatiker* (1885)[28] and by F. B. Tarbell who . . . wrote on 'Phonetic Law' in the *Transactions of the American Philological Association*, Vol. XVII (1886). . . . The strife came to its climax of energy in 1885 with Georg Curtius's book *Zur Kritik der neuesten Sprachforschung*, with the replies contained in Delbrück's *Die neueste Sprachforschung* (1885) and Brugmann's *Zum heutigen Stand der Sprachwissenschaft* (1885), and with the various reviews and 'Besprechungen' which swarmed about the three books. Since 1886 there has settled down upon the battlefield the quiet of weariness, though not of conviction. Occasional guerilla outbursts alone disturb the peace."[29] Today it would be hard to find a linguist who still believes in the theoretical identity of the laws of sounds with those of nature or in their exceptionless application, although in practice it is taken for granted that the established correspondences in the his-

[27] *Cf.* Hermann Osthoff and Karl Brugmann, *Morphologische Untersuchungen auf dem Gebiete der indogermanischen Sprachen*, Introduction.

[28] *Cf.* Hugo Schuchardt, *Ein Vademekum der allegemeinen Sprachwissenschaft*, pp. 51–88.

[29] B. J. Wheeler, "The Causes of Uniformity in Phonetic Change," *Transactions of the American Philological Association*, Vol. XXXII (1901), p. 56.

tory of sounds have to be respected if etymologizing is to be given any credit. If, nevertheless, the term "phonetic law" is still widely used, its meaning has thoroughly changed.

Arguments in the Consistency Controversy

What its present interpretation is, and how it has come about, can best be shown by a general survey of the arguments that were advanced by both sides during the time of the controversy. That there could be no question of natural laws in the development of language was gradually realized by most linguists. Even Hermann Paul, one of the champions of the Neo-Grammarian program, wrote in his *Prinzipien* (3d edition, 1898): "The concept of phonetic law is not to be understood in the same sense as that of the laws of physics and chemistry. The sound law does not affirm what must always happen under certain general conditions; it only states the uniformity of certain historical phenomena within a given group."[30] "If, therefore, we speak of a consistent action of sound laws, we mean only that within the same dialect all individual cases with the same phonetic conditions are treated in the same way."[31] It sounds paradoxical that the idea of natural laws could be given up while it was still believed that there was no escaping from their action during the period of their operation. For the mere fact that phonetic laws come into existence, gradually grow, and die out implies a decreasing number of exceptions while the application of the law spreads and an increasing number of them during the period of its disintegration. It would seem that a law which is exceptionless is also universal, immutable, and eternal and therefore precludes all possibility of change or evolution. The logic of this inference could not long remain unrealized, but it was thought that were the study of

[30] Hermann Paul, *Prinzipien der Sprachgeschichte*, 3d ed. (1898), p. 61.
[31] *Ibid.*, p. 62.

language to be placed on a scientific basis, the assumption of consistent laws was simply indispensable. Hence the most astonishing mental contortions were resorted to in order to reconcile the concept of exceptionless applicability with that of transitory growth and disintegration.

We have already mentioned that it was stated emphatically that a change resulting from the action of another phonetic law could not reasonably be advanced as an exception invalidating the regularity of the primary law. Still, the question might be asked why in one case law X obtains, in the other, law Y? For instance, why is the action of Grimm's law[32] suspended in the preterit plural of strong verbs while in the singular it is normally operative? The answer that is, of course, given, namely, that the accent is responsible for the difference, does not seem very cogent. Why should the accent be considered as a mere conditioning circumstance instead of being interpreted as part and parcel of the change? The question is really why in one form of a word the accent is on the stem syllable, in the other, on the suffix or ending. The trouble with phonetic laws is that in their formulation mere accompanying circumstances are often presented as if they were real causes.

It was also maintained that exceptional phonetic features resulting from dialectal or language mixture were not to be considered as interfering with the regularity of the laws of sounds. But again, if a definition of dialectal mixture was

[32] Among other things Grimm's law establishes that the Indo-European voiceless stops *p*, *t*, *k* became in Primitive Germanic *f*, *þ*, *χ*. But according to Verner's law these voiceless spirants *f*, *þ*, *χ* became voiced *b*, *ð*, *g* when the immediately preceding sonant in a word did not possess the main accent in Indo-European. Now, in the perfect of Indo-European verbs the accent was in the singular on the stem, in the plural on the ending. Hence, in the singular the main accent preceded the final stem consonant, in the plural it followed it, and when that consonant was, for instance, *k*, it became *χ* (=*ch* or *h*) in the singular but *g* in the plural. This explains A.-S. *seah* (='he saw') but *sāgon* (='we saw'), and also Mod. E. *was* but (*we*) *were*, in which latter form the *r* was originally *z*. See also pages 220 and 239.

asked, it was made dependent upon each individual case. Even clipped words[33] like *Bob, Ned, Fred,* etc., were assumed to be loan words because borrowed from the nursery speech, which on this occasion had to act as a dialect. Similarly, so-called spelling pronunciations, like "perfect" instead of "perfet," were looked upon as loans from the written language and were therefore declared free from the action of phonetic laws. It is clear that if we are so liberal in the extension of the meaning of language mixture, we should be consistent and look upon any kind of language as an essentially mixed product of social interaction. And, indeed, Hugo Schuchardt insists that in language practically everything is mixture. Where, then, do phonetic laws come in at all, if they do not apply to the products of linguistic mixture? That a word which is borrowed at a certain period is not retroactively submitted to the changes to which it would have been, had it been borrowed five hundred years ago, is a truism. Once, however, a foreign word becomes part and parcel of a language, it loses its foreign character, and its phonetic make-up changes just like the rest of the lexical material.

Further restrictions made in the definition of a phonetic law were that it obtained only within the same dialect, during a certain period of time, and in such cases as exhibited the same phonetic conditions. But when stress was laid upon the need for a clear definition of "the same dialect," the delimitations became so circumstantial that eventually the only subject of the law left was the individual speaker at one particular moment of his speech. Obviously, a law whose action is so limited as to apply to one empirical fact only is no longer a law but an experience or fact. As to the period of time during which a phonetic law is said to be operative, it was admitted that this could be determined

[33] *Cf.* page 299.

only *a posteriori;* that it might be long or short; that the action might set in suddenly and generally over a large territory or gradually spread from the individual speaker or one local center to wider circles. But how all this could be reconciled with the concept of exceptionless application is more than could be explained by the subtlest representatives of the theory. Moreover, strictly speaking, there is no such thing as "the same phonetic conditions." The conditions of production of a sound in speech are always so complex that they are never quite the same. Which are the essential, which the negligible elements in the complex process of sound producing it would be hard to say. Is it the accent, the syllabication, the nature of the preceding sound, that of the following one, that of both the preceding and the following, etc.? The answer to these questions would depend upon each particular "phonetic law," so that there is no criterion for the determination of what are to be "the same phonetic conditions."

Alleged Deductive Evidence

Unconsciousness of Sound Change.—It is, therefore, a matter of little surprise that most Neo-Grammarians eventually admitted the impossibility of proving by the inductive method the existence of absolutely consistent phonetic laws. In other words, it was granted that probably it would never become possible to eliminate and explain scientifically all sporadic freaks in the phonetic status of a language. But it was insisted that sufficient deductive evidence could be given to place the theory upon a sound basis. In the first place, the very nature of the sound change was analyzed as a purely physiological, mechanical, and unconscious process, so that the laws governing it could only be of the same character. To this Hugo Schuchardt replies that the part played by consciousness in the development of speech sounds is much greater than is usually realized. The mere

fact that a sound change may be prevented or interfered with by analogy shows that it is more than a mere mechanical process, because analogy as a psychological factor could not exert any influence upon a change that would itself be in no way psychologically conditioned. In a case of phonetic change caused by a physiological defect of a person's or a people's speech organ analogy would be absolutely powerless. It is quite true that sounds which at one time were significant disappear in the course of time just as if they were entirely meaningless. Yet it has never been shown that those sounds of a word which at a given time were felt to be the carriers of some semantic part or whole were eliminated while this feeling was still alive. Besides, it is inaccurate to oppose as essentially different the effects of analogy to those of the so-called phonetic law. In many cases they actually coincide or it is impossible to decide whether a linguistic product is the result of one or the other. When a child who has never heard the past tense of the verb *to play* says "I played" after the analogy of such forms as "I turned," "I dreamed," "I jumped," etc., which it has actually heard or perhaps used before, the result of the analogical process is exactly the same as that of a mechanical reproduction would be. How analogy and organic change may coöperate to produce uniform effects, is further shown by the cases of purely phonetic analogy to which Schuchardt repeatedly calls attention. In Italian, for instance, Vulgar Latin $\bar{e}$, $\bar{o}$ were perhaps at first transformed into *ie, uo* only in such words as had an *i* or *u* sound in the following syllable; thus, Ital. *vieni, buonu, buoni.* This change would be a so-called mechanical one. Then, semantic analogy may have caused the same mutation of $\bar{e}$, $\bar{o}$ to be extended to such forms as Ital. *viene, buona,* where no *i* or *u* sound followed. Finally, by a process of purely phonetic analogy the sound change may have affected words in which neither a succeeding *i* or *u* sound nor semantic analogy entered as determining factors: for example, Ital.

pietra, ruota, etc.[34] Likewise, phonetic analogy is made to account for the two coexisting forms of Provençal *fo* and *fon* (Lat. *fuit*) after the example of the adjective forms *bo–bon* and *ma–man.* In this instance *fo* is the form resulting from regular phonetic development, while *fon* is the effect of analogy. On the contrary, Provençal *vendo* is an analogical by-form of *vendon* (='they sell'). In English we may mention the insertion of the [r] sound between two vowels where it does not belong: "idea–r of," "America–r and England," "the law–r of the land," after the analogy of such expressions as "far away," "air and sea," etc.[35]

Uniformity of Direction of Sound Change.—Another deductive evidence in favor of the exceptionless operation of phonetic laws was found in the alleged fact that within the same dialect a sound occurring in the same surroundings never simultaneously developed two different sounds. It was admitted that during a period of transition, or with the individual speaker, a fluctuation of pronunciation could affect a sound originally the same, but it was dogmatically asserted that such fluctuation could not become a lasting feature. The main arguments advanced were to the effect that sound change is unconscious; that the production of the same sound under the same phonetic conditions is governed by the same motor sensation; and that the social use of language necessarily results in the leveling out of all forms and sounds. Apparent exceptions to this rule were expected to be gradually eliminated as new phonetic laws were discovered. But we have already pointed out that consciousness is not altogether foreign from linguistic change, although its rôle has never been scientifically defined. It seems especially

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[34] *Cf.* Hugo Schuchardt, *Vademekum,* p. 57; Eugen Herzog, *Streitfragen der romanischen Philologie,* pp. 37*f.*

[35] *Cf.* Fritz Neumann, "Ueber einige Satzdoppelformen der französischen Sprache," *Zeitschrift für romanische Philologie,* Bd. VIII, p. 257; Jespersen, "Die Lautgesetzfrage," *loc. cit.,* p. 211.

important in the spreading of a certain change over larger and larger territories. As far as the social leveling is concerned, it is contrary to our experience that this should be so strict as to allow of no lasting fluctuation. Why should a sufficient degree of intelligibility be threatened by the coexistence of two sounds or forms resulting from one? As a matter of fact, numerous examples of autochthonous and simultaneously arising doublets occur continually in the history of any spoken dialect.[36] The change of a sound or sound combination does not depend only upon its phonetic surroundings. Even if these are the same, the frequency of use, the need of being understood, and many other circumstances may act as influencing factors. The more often a word occurs and the more easily it is understood, the greater and quicker the changes of its sounds are likely to be. In every language we meet with the phenomenon of very advanced phonetic corrosion or contraction in words and formulas of especially frequent occurrence. The Dutch use the syncopated form *broer* ('brother') commonly in conversation when the single word is intended, but in compounds it has never been able to displace the longer form *broeder* because its occurrence in the function of a component is much rarer; in Spanish "vuestra merced" became *usted* ('you'); in French "s'il vous plaît" is often abbreviated to [splɛ]; in German "Guten Morgen" as a greeting formula is pronounced [mɔɪn]. As to the argument based upon the motor sensations, it was chiefly elaborated by Paul[37] and extensively used afterwards by many of the protagonists of consistent phonetic laws. The gist of it was that the motor sensation does not take shape for each word singly; on the contrary, whenever in a language like elements recur, their production is regulated by the like motor sensation. In case, therefore, the motor sensation is modified through the

[36] See Albert Dauzat, *La géographie linguistique*, pp. 47*f*.
[37] *Cf*. Paul, *op. cit*., pp. 54*f*.

pronunciation of an element in any given word, then the modification asserts itself for the same element in another word. This implies that all phonetic change subject to laws is gradual and "that the different occurrences of the sound element in different words are bound together hard and fast by the one memory image of the motor sensation."[38] However, it seems to be a gratuitous affirmation that sound changes are exclusively determined by the acquired motor sensations and that they do not progress from word to word instead of from sound to sound.[39] Besides, if Paul's theory were true, a sound would have to be changed in the same direction in all its combinations, and this direction would be determined by the motor sensation of the sound concerned. That this is not so not only is evidenced by the facts, but might be gathered from a general study of human behavior. Nowhere in the formation of human habits do we find such consistent uniformity as would exclude all possible or actual vacillation.

Present Meaning of "Phonetic Law"

And so we see that the pretentious theory of the Neo-Grammarians has crumbled down to a point where even the the term "law" has become irrelevant, not to mention its exceptionless application. The maximum of meaning that can be given to what still goes by the name of "phonetic law" is that at a certain time and in a given dialect a certain sound changed to another under certain phonetic conditions. The restriction as to time, place, and dialect as well as the great elasticity of meaning characteristic of such expressions as "a certain time," "a given dialect," and "certain phonetic conditions" at once place the phonetic law at a great remove from what natural scientists are wont to call "laws." In

[38] Wheeler, "The Causes of Uniformity in Phonetic Change," *loc. cit.*, p. 10.

[39] *Cf.* Hugo Schuchardt, *Vademekum*, p. 72; Wheeler, *loc. cit.*, pp. 10*f.*

linguistics it would be decidedly better to avoid the term in the Neo-Grammarian sense because of the misleading implications it may convey to the layman. The scope of our phonetic laws is so limited, their value is so local, the facts involved are often connected by such superficial ties, that the words "rule" and "regularity" are more than sufficient to connote all that is actually intended, and we should never be surprised to meet with exceptions. In proportion as the psychological aspect of the production of speech sounds becomes better known and as the study of experimental phonetics progresses, the meaning of the expression "phonetic law" will shrink. Eventually we shall have to recognize that from a purely phonetic point of view practically any sound change is possible and explainable. If in spite of these considerations the term "law" is still adhered to in linguistic terminology, great care should be taken not to operate with it as if it symbolized a reference to more than what it is actually entitled to.

Methodological Necessity of Phonetic Laws

It has been maintained that although theoretically phonetic laws may not act with consistency, it is imperative for practical and methodological reasons to proceed as if they did. Otherwise we should return to the old method of unscientific and arbitrary etymologizing, and indeed linguistics would cease to be a science. Whatever truth there may be in this statement, it is quite certain that if the scientific character of linguistics depended upon the resemblance of what we call phonetic laws to what the natural scientist calls laws of nature, there would be little chance of our study of language ever becoming scientific. Correct etymologizing does not imply more than a practical belief in certain formulae of phonetic correspondence. Such belief simply means that in view of the regularities that have been established, it would be unsafe to venture some etymological explanation

positively conflicting with such regularities. It does not mean that a conflicting interpretation is always and necessarily impossible, since other conditions or causes may have been operative than those suggested by any established phonetic law. Schuchardt very properly remarks that instead of being a boon to the science of language, belief in exceptionless laws of sound is a real danger, because it paralyzes possible efforts to investigate further into the real causes of phonetic change. That such causes exist is evident, but it is no less certain that many of our so-called phonetic laws do not so much as hint at them.

Analogy

Analogy as a Rival of Phonetic Law

We have not refrained from referring to analogy wherever its meaning could be inferred from the surrounding context. Now it becomes imperative to look a little more closely at this would-be rival of phonetic law. That their rivalry does not necessarily involve a mutual exclusion has been repeatedly adumbrated. The traditional view about analogy was derived from a comparison of extreme cases. If we contrast a phonetic change in which meaning has evidently played no part but which is clearly somehow dependent upon the influence of sound upon sound, with another change in which apparently nothing but semantic analogy has been operative, the temptation is very strong to oppose phonetic law and analogy as rival factors. The umlaut in a word like the German plural *Gäste* ('guests') is explained as a phonetic process of assimiliation, since the *a* of *Gast* was followed by *i* in the plural form whereas in the singular it was not (compare O.H.G. sing. *gast*, plur. *gesti*). On the contrary, in the word *Hälse* ('necks') the umlaut is rather a product of analogy, as there followed no *i* in either the singular or the plural (compare O.H.G. sing. *hals*, plur. *halsa*). If phonetic

law alone had been at work here, the *a* of the ending should have protected the *a* of the stem from any modification in the direction of *i*. But later, when in words of the type of *Gast–Gäste* the plural ending was dropped so that the only difference between singular and plural was the modified stem vowel, this modification came to function as a means of systematic plural formation and was analogically extended to many words to which it did not belong by right of purely phonetic influence. In other words, it was assumed that analogy was based upon some kind of semantic, syntactical, or categorial likeness. From a phonetic point of view the words *Gast* and *Hals* have little in common, but the relationship of singular to plural is the same whether applied to one or the other. Hence, the form of symbolization for this relationship known in the case of *Gast–Gäste* and other nouns of the same type was also applied to *Hals*.

Equational and Combining Analogy

Hermann Paul reduces all analogical formations to certain proportional equations,[40] of which three terms are known and the fourth is the inferred analogical product. Thus, {*Gast* : *Gäste* = *Hals* : *x* (= *Hälse*)} or in English {*play* : *played* = *walk* : *x* (*walked*)}. To this it is being objected that in many cases it would be difficult, if not impossible, to point out three known terms that would account for the fourth unknown. Accordingly, it would be more correct to explain a number of analogical formations as direct combinations of independent elements with one another rather than as proportional findings. For instance, instead of saying that the genitive *men's* is the result of the unconscious equational inference represented by the formula {*man* : *man's* = *men* : *x* (= *men's*)} or {*children* : *children's* = *men* : *x* (= *men's*)}, it would be psychologically more accurate

[40] *Cf.* Paul, *op. cit.*, pp. 96*ff.*

to speak of a direct combination of the semi-independent genitive element *-'s* with the noun *men*. At any rate, the difference referred to would supply the basis for a distinction between equational and combining analogy.[41]

Analogy a Universal Factor

The effect produced by analogy may or may not conform to the established facts and system of a given language. Whether a child says "I learned" or "I comed" after the analogy with other weak verbs known to him, the process is essentially the same. Formerly it was customary to regard as analogical results only those which were deviating from the recognized patterns and rules prevailing in a language. The static system of a language was felt to be the only criterion for the appraisal of the character of linguistic change. Hence, all analogical formations were said to be "false." This conception was closely related to the belief that analogy had not been operative at all, or, at any rate, very rarely, in the ancient periods of language history; its abundant action in later stages was due to the loss of a fine feeling for speech consistency. Today it is generally admitted that analogy has always been and always will be an influential factor in the making and use of language and that it may result in conforming or deviating combinations both of which are equally correct from the point of view of the speaker's association. Every language recognizes as actually correct hundreds of analogical forms which, when they first cropped up, were at variance with the current linguistic conventions.

Relation of Analogy to Phonetic Law

It is also a widely spread practice to refer to analogy as to a "force," an "agency" which tends to the creation of new forms in conformity with others already experienced and

[41] *Cf.* Jespersen, "Die Lautgesetzfrage," *loc. cit.*, pp. 193*f.*

known. Being based upon a mental association, it is, of course, essentially a psychological "factor," and it was for this reason that Neo-Grammarians used to oppose it to phonetic laws, which they wrongly interpreted as purely mechanical, physico-physiological agents. The effects of such erroneous conceptions are extremely slow to die. Even today we often feel satisfied when in connection with some peculiar form in language we are able to point out either an articulatory influence or the existence of a number of analogous forms. Yet analogy is no more a "force" or "causative agency" than what is termed a phonetic law or its physiological foundation. Analogy is a mere fact of likeness apprehended by the speaker. What has to be accounted for is the speaker's reaction to this fact apprehended. If the reaction were always and necessarily in the same direction, if it were always or nearly always to the effect that one form is made to resemble phonetically the other, we might be justified in looking upon their semantic likeness as a cause. But in reality we find that a semantic or functional analogy now results in a formal leveling out, then again it does not. In other words, the reaction to the fact of analogy on the part of the speaker may take one of two exactly opposite turns. More than that! Supposing that the leveling effect has actually taken place, what accounts for form A having assumed the features of form B rather than vice versa? In order to explain all this, recourse must be had to more fundamental agencies than the fact of likeness itself. There are, among others, two antithetical tendencies operative in the process of linguistic change, the tendency to uniformity and that to differentiation. How they balance each other in producing that dynamic rhythm characteristic not only of language but of life in general, why one acts now and then the other, these are problems largely unsolved in spite of their fascinating interest. But if we review the facts of linguistic change, we can connect a very large number of them

with either of these two fundamental tendencies. Naturally, every so-called case of analogy is a manifestation of the tendency to uniformity, but by no means all so-called mechanical changes are due to the rival tendency to differentiation. For instance, the latter is responsible for dissimilations and diphthongizations, but it is the tendency to uniformity that effects all assimilations and monophthongizations. Far from being two essentially different phenomena, analogical leveling and the action of phonetic laws are often of the same type. Moreover, it is entirely arbitrary to limit the meaning of the term "analogy" to cases in which the existing likeness is semantic. We have previously given examples of purely phonetic similarity connected with corresponding sound changes, and this sort of analogy is perhaps more frequent than is generally realized. As a matter of fact, the kind of likeness is of no importance; it matters not whether it is lexical, syntactical, categorial, or whether it is to be found in the phonetic surroundings. Even with regard to the example *Gast–Gäste* it may be argued that the change of [a] to [ɛ] under the influence of a following *i* is after all nothing but a partial analogical leveling of two sounds. The likeness is to be looked for in the occurrence of both *a* and *i* within the same word. The part played by analogy in linguistic change is confined to this: it helps determine the particular feature to be leveled out. It still leaves us without a hint as to why form A has taken the feature of form B rather than form B assuming the peculiarity of form A. In no way does the prevailing analogy cause the change to take place.

Material and Formal Analogy

An attempt to classify the various cases of analogical leveling must meet with great difficulties on account of the large number of possible criteria. By way of illustration we shall only point out another distinction more or less common among linguists. It is based upon the morphological func-

tion of the influencing form and that which is influenced. It must be remembered that in Indo-European, morphological words are at least theoretically decomposable into a part called the radical or material and another called the formal or functional element. Hence, if an analogical formation is founded upon the similarity of the radical element, we speak of *material* analogy; if it is based upon the similarity of the functional or nonradical element, we speak of *formal* analogy. Examples of both types are extremely frequent in all our modern European languages. In Middle English the vowel gradation in the conjugation of the verb *to ride* was in the preterit singular *ō*, in the preterit plural *i*; consequently we had in the singular, 1st pers. *rode*, 2d pers. *rode*, 3d pers. *rode*; in the plural, 1st pers. *riden*, 2d pers. *riden*, 3d pers. *riden*. In Modern English the stem vowel of the singular has been substituted for that of the plural. On the contrary, in the preterit of the verb *to find* it was the vowel of the plural that replaced that of the singular. In French the Latin short *ĕ* in accented open syllables has become *ie* (compare Lat. *lĕporem*, Fr. *lièvre*; Lat. *fĕbrem*, Fr. *fièvre*; Lat. *bĕne*, Fr. *bien*, etc.; but Lat. *vĕntre*, Fr. *venir*). Hence the present indicative of *lĕvāre* was in Old French:

Sing.	1st	pers. *lieve*	Lat. *lévo*
	2d	pers. *lieves*	Lat. *lévas*
	3d	pers. *lieve*	Lat. *lévat*
Plur.	1st	pers. *levons*	Lat. *levámus*
	2d	pers. *levez*	Lat. *levátis*
	3d	pers. *lievent*	Lat. *lévant*

But in due time the forms with *e* proved to be stronger and eventually replaced those with *ie*, as may be seen from the modern French conjugation, *lève*, *lèves*, *lève*, etc. Since in these examples the analogy is exclusively confined to the stem of what are considered mere varieties of the same word, we have illustrations of material analogy. On the other

hand, that English verbs like *dig*, *wear*, *stick*, *spit*, etc., are today strong, or that such other verbs as *dread*, *flow*, *walk*, *let*, etc., have become weak, is due to formal analogy. Similarly, the German words *Stuhl* and *Acker* are original *a* stems and should have no umlaut in the plural (compare O.H.G. sing. *stuol*, *ackar*, plur. *stuola*, *ackra*). The modern forms *Stühle* and *Aecker* are therefore obtained through formal analogy with plurals of the type of *Gäste*, *Aepfel*, etc.

CHAPTER VII

CAUSES OF PHONETIC AND LINGUISTIC CHANGE

More Fundamental Explanations Sought

Many of the sins of the Neo-Grammarians in regard to phonetic laws and analogy can be summed up in the adage of medieval philosophy "cum hoc, ergo propter hoc." Mere accompanying circumstances are presented as necessary prerequisites without which certain effects would not have come about. In the meantime it has been shown that in many of our phonetic laws there exists no essential or inclusive relationship between the circumstantial premises and the following results, and so we are still confronted with the need of a more fundamental explanation. Why is it that sound changes occur at all, and why do they follow certain channels here, others there? Why are they so astonishingly regular and uniformly spread over large territories? Why are the alterations so few and slow during one period or in one language, so numerous and fast at other times or elsewhere? Questions like these are of the greatest interest, since the answers would at once enable us to group the many scattered and apparently independent changes under one or a few general headings and to understand the relationship that holds them together. Unfortunately, the attempts that have been made in this connection have only yielded a number of relatively plausible theories which give no more than a partial account of the phenomena.

Climate

In the first place, climatic conditions are sometimes alleged to be the cause of linguistic change in general and of phonetic

transformation in particular. It has been pointed out[1] that the harshness of Doric was due to the wild, mountainous conditions of Laconia, while the softness of Ionian has been attributed to the climatic mildness prevailing on the coast of Asia Minor. The grating guttural *ch* sound of the German-Swiss dialects has been traced to the raw mountain air of the country. It has been maintained that the English avoid opening their mouths in the formation of their vowels because of the misty atmosphere of the British Isles,[2] and so on.

Naturally, it is not unlikely that a change in climate, in air pressure, geography, the conditions of the soil and of life will have its influence upon language, but it seems extremely difficult to go beyond a general statement to that effect. If at least it could be shown that such climatic conditions were responsible for the shape of the organs of speech, a good point would be gained in favor of the theory. But up to the present no conclusive data have been gathered in this respect. In districts with practically the same climate we find entirely opposite developments of sounds, and in such regions as are climatically contrasted we meet with identical or similar changes. As to the suggestions made in regard to Doric, Swiss-German, English, etc., it is easy to see that they are arbitrary. A guttural *ch* sound of very much the same character as the German-Swiss is also present in Dutch, and yet in Holland even hills are extremely rare. As far as the degree of mouth opening on the part of Britishers is concerned, if the given climatic reasons were true, it would be safe to predict that eventually the English language would develop a large number of clicks. If there be any relationship between climate and phonetic change, it can only be of a highly indirect nature.

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[1] *Cf.* K. W. Krüger, *Griechische Sprachlehre*, I, pp. 3, 4.

[2] *Cf.* Paul Passy, *Etude sur les changements phonétique et leurs caractères généraux*, p. 249.

Modifications of the Speech Organ

Nor is there good evidence for the theory that phonetic change is due to modifications of the speech organ.[3] No doubt, when certain bodily features are very prominent, the pronunciation of sounds will be somehow affected. The formation of the teeth may influence the production of dentals and sibilants, thick and swollen lips are likely to change the character of labials, etc. But it must be remembered that the acoustic features of sounds are not necessarily correlated to a definite shape of the organ of speech, as compensating adjustments may neutralize anatomical differences. Of greater importance are certain customs of maiming parts of the speech organ. Savage tribes that eliminate their front teeth, split their lips, or attach ornamental objects to them are rendered unable to produce certain dental or lip sounds, the absence of which from their language may persist even after the customs have been abandoned. But aside from such evident cases the observed facts do not countenance the present theory. There is no standard shape of the speech organ for each language, although in spite of countless individual discrepancies minor features might be pointed out as more characteristic of certain linguistic groups. But it would be equally legitimate to revert the causal connection by ascribing these discrepancies to the different sound systems of the respective languages. Furthermore, we are not concerned here with the horizontal or simultaneous differences between different languages, but with the historical and vertical differentiations found in the same traditional

[3] *Cf.* Albert Dauzat, *La géographie linguistique*, pp. 31, 135. Van Ginneken says (*Indogermanische Forschungen*, Bd. XLV, March, 1927, p. 4): "Die bekannte Prognathie der Iberer und Spanier hat dort ja von alters her jedes eindringende labiodentale *v* zu einem bilabialen *b* und jedesse harfe *f* zu einem schwachen, nochh alb bilabialen *h* gemacht—eine Erscheinung, die wie mir bekannt war, auch in allen Kreolen, Negersprachen vorkommt." See also H. C. Wyld, *Law in Language*.

language. Surely, there are no data showing that the phonetic shifts from Middle to Modern English were parallel with corresponding anatomical changes of the speech organ.

General Variability of Pronunciation

Attention is also called to the general variability of pronunciation as a possible basis of explanation. We know not only that different persons do not pronounce their sounds and words exactly alike, but that the same individual's articulation varies slightly at different times and in different moods. These imperceptible variations are claimed to follow definite directions and eventually to accumulate so as to result in considerable and noticeable transformations. In conjunction with this theory stress is laid upon the transmission of language from generation to generation. The process of language-learning by children is founded largely upon imitation, and it is generally known that in their efforts to reproduce what they hear they are not always successful. Important imperfections will be corrected in due time, although it sometimes happens that nursery words or children's corrupted pronunciations are perpetuated within the limits of a family or adopted by the community at large. Generally speaking, the deviations are so slight that they are hardly observable from one generation to another, but after a number of successive generations they will accumulate and become very obvious.

Up to a point, conditions as described here are quite authentic, although some dialects are known to have kept pretty much the same sound system for centuries.[4] But no reason is given for the particular turn that the sound changes will take or for the fluctuations in the speed with which they will spread. Rather than being the cause of phonetic evolution,

[4] *Cf.* Hermann Fischer, *Geographie der schwäbischen Mundart*, p. 6; also Friedrich Kauffmann, *Geschichte der schwäbischen Mundart im Mittelalter und in der Neuzeit*, p. x.

the variability of speech is hardly more than a phase, another aspect, of the very phenomenon whose cause we are about to seek.

Historical and Cultural Conditions

To what extent historical and cultural conditions are of significance for the development of language it is difficult to define. A community removed from the great currents of world events is believed to preserve its language in a more conservative way than a people whose history is closely linked up with the destiny of other nations. Yet many examples could be given to discredit this opinion. In spite of the greater rôle played by Spain in the history of the world, its language reveals fewer discrepancies from Latin than Portuguese. The history of a people is made up of innumerable events, not all of which are of real consequence from a linguistic point of view. It is highly probable that language mixture[5] causes extensive changes in the phonetic system as well as in the other phases of language. But unless we consider all speech as involving a mixture of individual peculiarities, only certain languages have been subjected to sudden intermingling on a large scale, and that only at definite periods of their history. Many phonetic and other changes must undoubtedly be the effects of causes foreign to such a mixture. On the other hand, the vicissitudes of social and cultural conditions are sometimes strikingly parallel with linguistic developments. The centralization or decentralization of the forces that guide the social and cultural life of a people are evidently of considerable importance. But, again, the complexity of the phenomena is so tremendous that their significance in regard to language can only be guessed at.

[5] *Cf.* George Hempl, "Language Rivalry and Speech Differentiation," *Transactions of the American Philological Society*, Vol. 39 (1898). See also on pages 262, 274, 362 of this book.

Genealogical Succession

Eugen Herzog in his *Streitfragen der romanischen Philologie* propounds a theory based upon what he calls the principle of alternation ("Alternistisches oder Ablösungsprinzip").[6] The speech organs of children grow with their age. Not only does the organ become larger and harder, but the growth of one part of the organ is not necessarily proportional to that of the others, so that in addition to the increase in size there occurs a change in the relative position and shape of the various parts. This cannot but have a substantial influence upon the timbre of the sounds uttered, so that the acoustic effect of the speech of grown-ups is not the same as it was in their childhood. This acoustic effect produced by the articulation of the adults is then imitated by their children, but because the speech organs of the latter have a different anatomical structure, they must needs resort to a different physiological articulation if they wish to produce the same sounds as those which they hear. This process is repeated when the children have in turn grown up and become the models for imitation on the part of their descendants, and so on. Hence the gradual articulatory and acoustic shifts may be represented by the following table:

		Articulation	Acoustic Effect
Generation I	Young	x_1	x_1
	Old	x_1	x_2
Generation II	Young	x_2	x_2
	Old	x_2	x_3
Generation III	Young	x_3	x_3
	Old	x_3	x_4
		etc.	etc.

[6] *Cf.* Eugen Herzog, *Streitfragen der romanischen Philologie*, I, pp. 56*ff.*

Of course, it is quite rational to believe that some such progressive and cumulative adjustments take place. At least, they would explain in part a certain type of facts. But with respect to all changes based upon semantic analogy a series of anatomical and acoustic differentiations is entirely irrelevant. Likewise, assimilations, especially those at a distance, dissimilations, metatheses, and various other kinds of phonetic modifications are beyond the reach of such influences as those referred to here. Even when it is a question of so-called autonomous changes, the theory leaves us without a satisfactory explanation why some changes follow definite directions in one language and others elsewhere, why they sometimes occur with great speed, sometimes slowly or not at all. One is tempted to ask also why an adult could not form his sounds so as to produce the same acoustic effect as they had when uttered in his childhood. If a child with his smaller and otherwise different organs of speech is able to produce sounds similar to or identical with those it hears uttered by his older model, why should the latter be forced to stick to his former articulation in spite of the different acoustic effect? Could not this very acoustic change induce him to alter his articulation accordingly as he grows older? It is a gratuitous assumption that, owing, no doubt, to a sort of motor sensation, a person's articulation should remain the same in spite of structural changes in his speech organ. It has never been proved that a motor sensation is of a more conservative nature than an acoustic one. Besides, how can we ever expect this theory to be corroborated by experience? Its essential premises of acoustic change due to anatomical growth and of a cumulative progression of such changes in the alternation of generations could not easily be established. The explanation appears particularly inadequate if we remember that a child's pronunciation is influenced not by one speaking individual but by a great many.

Economy of Labor

One of the most popular explanations centers in man's instinctive economy of effort and labor.[7] It is claimed that the tendency to avoid difficult sound combinations, to eliminate superfluous sounds, to facilitate in general the work to be performed by our organ of speech, is responsible for all or most phonetic changes. That this is not so becomes *a priori* evident if we consider how relative such a concept as economy is. Combinations which are found very easy by the speakers of one language may seem regular acoustic atrocities and articulatory feats to those of another, even if we assume the observers to be phonetically trained. Nor can it be successfully maintained that a certain prevailing pronunciation is always simpler than that which preceded it. Why should High German *Pflanze* be more easily pronounceable than Latin *planta*? Although it appears to happen more frequently that sound combinations are simplified and that sounds are weakened in the course of time, the opposite development is by no means rare. Voiceless sounds become voiced, but the latter also become voiceless; stops become spirants, but the reverse occurs too. Economy is certainly an important factor in phonetic history, but it is always counterbalanced by the necessity for comprehensibility. If this theory with all its implications were true, a language would eventually reach a point where the maximum of economy was attained and further developments would be impossible.

Temper

Some linguists insist upon temper as a factor of consequence. It is generally admitted that the speed, the tone, the rhythm, the tenseness of articulation are immediately

[7] W. D. Whitney, "The Principle of Economy as a Phonetic Force," *Transactions of the American Philological Association*, 1877, pp. 123–34.

affected by the momentary temper of the speaking individual and by the habitual temperament of a people. Accelerated speech, moreover, is likely to result in a greater number of mispronunciations or lapses, which, coupled with the instinct of imitation, are sometimes made responsible for a great many final alterations.

But temper is such an elusive thing that this theory also cannot be placed on a basis of definite facts. How could we ever hope to determine the difference in temperament between the English people of today and their ancestors of five hundred years ago and to correlate this difference with the phonetic changes that have occurred? Again, how are we to explain the discrepancies in the phonetic development of neighboring dialects spoken by people of very much the same type and temper while we find perfectly parallel phenomena of change among communities widely separated from each other and with entirely different temperamental qualities? As to lapses,[8] we do not wish to minimize their importance, but a theory which reduces all phonetic change to mispronunciation, either by children or by adults, bristles with unexplainable difficulties.

Instinct of Imitation

The instinct of imitation is invoked by those who place the origin and spreading of altered pronunciations upon the same line as changes in the fashions of clothes and human customs.[9] At the same time they stress the individual character of the original changes. One or a few influential persons in a community group become the models after whose speech that of the others is shaped, and in its turn this group, if sufficiently influential, is imitated by others. Fashion, it is

[8] *Cf.* H. H. Bawden, *A Study of Lapses*; Rudolf Meringer, *Aus dem Leben der Sprache.*

[9] *Cf.* Friedrich Müller, "Sind die Lautgesetze Naturgesetze?" *Techmers Zeitschrift*, Bd. I, pp. 213*f.*; Meringer, *op. cit.*, pp. 231*ff.*

pointed out, is far more regular and subject to laws than is generally admitted. Allowance must be made, however, for all kinds of personal caprices of the influential individuals and groups and for many crossing and neutralizing factors. This would explain the partial regularity and generality of the changes as well as the many unexpected deviations. But the opponents of this theory remark that many developments are shown to take place more or less simultaneously over wide territories whose various social groups are often without any immediate contact. All such modifications as are believed to be general in origin, because they are the result of a shift in the bases of articulation and audition, cannot be explained by a process analogous to fashion. They must occur by reason of common causes affecting all the individuals at the same time. Besides, it might be asked whence the leading personalities or groups themselves get those linguistic peculiarities which will supply the material for imitation.

Heredity

Quite recently[10] an interesting theory has been more elaborately worked out by Jacob J. A. van Ginneken, according to whom phonetic changes and their regularity are explainable as ordinary phenomena of biological heredity. In other words, the basis of articulation is a combination of anatomical structure and psychic tendencies which are inherited according to the same formulae and rules of probability as biological features. Because of the nonlinguistic terminology involved, and also because of the refreshing newness and stimulating originality of the theory, we shall dwell upon it at somewhat greater length.

Similarity based upon heredity is always relative, that is, never represents complete identity. The arising differences are grouped by biologists in three distinct classes: (1)

[10] *Indogermanische Forschungen*, Bd. XLV, March, 1927, pp. 1–45.

external or phenotypical modifications; (2) mutations; and (3) cross variations.

1. *Phenotypical Modifications.*—External or phenotypical modifications are those which result from external circumstances in individuals with identical hereditary properties. If these circumstances are of such a nature as to favor the realization of the innate tendencies, the resulting phenomena are externally aided but not caused by the circumstances. Their real cause is then innate or genotypical, and the phenotypic character of the features developed coincides with their genotypical character. But it often happens that external conditions are influentially stronger than hereditary predisposition, and in that case we shall witness the development of purely phenotypical features. These, however, by no means destroy the genotype; they only prevent it from producing its effects in the form of actually observable conditions or facts. In the meantime the hereditary tendencies continue to be latently alive and will assert themselves as soon as unfavorable circumstances weaken or disappear. Thus it is explained that of several children born to two tubercular parents some develop the dreaded disease, some do not. If, however, the latter marry partners whose constitutions are not strong enough to check the manifestation of the latent disposition and if other circumstances are not prevailingly counteracting, the children will be tubercular like their grandparents. And so the proportion of healthy and tubercular children may be determined according to the mathematical curve of probability. Furthermore, one phenotypic feature may be the result of one hereditary factor or it may be a compromise between two or more such factors. A crossing of the *Linaria maroccana alba* (white Moroccan toadflax) with a *Linaria maroccana rosea* (red Moroccan toadflax) yields violet-blue flowers. Conversely, two or more external features may be the result of one hereditary tendency.

If now we compare these biological data and principles with linguistic facts, we find a striking similarity. The basis of articulation characteristic of a given language or dialect is a genotypical or hereditary feature and may be described as resulting from one or several fundamental articulatory tendencies. Maurice Grammont shows that in Old Indian phonetic change is governed by a general tendency to concentrate articulations around the middle of the palate; a trend of French phonology consists in advancing the articulatory processes toward the front of the mouth. A limited number of fundamental tendencies can be distinguished, such as a labial, a dental, a cacuminal, a guttural tendency, whose countless combinations and blendings form the many characteristic bases of articulation of the various languages, dialects, and individuals. It is in conformity with these tendencies that the so-called autonomous changes occur in language, as when a sound is gradually palatalized without the influence of its phonetic surroundings in the word or phrase. And here, too, we can see how a single tendency may give rise to numerous separate changes, such as [k] > [s], [k] > [tʃ], [g] > [dʒ], [k] > [k͡], [u] > [i], [χ] > [ç], [g] > [j], all as a result of a palatal basis of articulation; or how several tendencies may combine in the formation of one empiric feature, as, for instance, when the tendencies of anticipation and of inertia coupled with the general drift toward front articulation produce French *buvant* with [y] instead of *bevant* with *e*, while the tendency of inertia or that of anticipation alone is not able to produce **vunir* instead of *venir* or **luver* instead of *lever*. On the other hand, phenotypical features are those which develop under the influence of analogy or of surrounding sounds (assimilations, dissimilations, etc.). If these circumstantial influences act in the same direction as the genotypical tendencies, the latter are strengthened and the resulting changes are not purely phenotypical. Thus, the development of O. Fr. *bevant* > *buvant*

was phenotypical inasmuch as the preceding and following labials influenced the vowel between them; it was genotypical inasmuch as it corresponded to several hereditary tendencies. If there is a conflict between the innate tendencies and the results produced by the action of external conditions, the genotype will slumber until more favorable conditions arise. A tendency may produce no tangible effect for centuries and then start vigorously affecting the language on a large scale.

2. *Mutations.*—The second type of hereditary differences in the representatives of various generations are called mutations. They arise often unexpectedly, even in unmixed breeding, and are also called idiovariations or idiokinetic differences. Instead of being mere external modifications in spite of identical genotypical qualities, they represent a shift of the genotype itself. The causes of this shift are very little known. Climatic conditions, disease, a dissolute life, or various other circumstances are sometimes alleged to cause the structure of immature germ cells to change more or less suddenly.[11] In biology such changes are called spontaneous, which simply means that their causes are not well ascertained. The development of human races, of regionally characteristic forms of face and skull, of family physiognomies, etc., provide typical examples of idiokinetic variations. It is understood that we are still considering cases of unmixed breeding, that is, such as result from the crossing of representatives of closely allied groups.

In language too we often notice sudden transformations, apparently spontaneous, without any externally perceptible influence of surrounding sounds. With the aid of a comparatively long chain of transmitted documents it is possible to watch developments during many centuries and to witness

[11] Prof. C. L. Huskins (McGill) points out to me that "X-rays have in recent years proved to produce mutations, but the effect of any other agency is still doubtful."

the origin of these transformations. In this way the interesting fact is discovered that so-called spontaneous changes, except, of course, where linguistic mixture is involved, are prepared by heteronomous modifications, mostly assimilations, which took place in the same direction several centuries before. Whether these heteronomous changes were aided by a certain genotypically preferred basis of articulation or whether they were of a purely phenotypical nature is of little importance; at the beginning they were dependent upon the influence of phonetic surroundings. Then, after all the words in which the heteronomous action can take place have been modified, a period of rest follows during which no more similar changes occur for want of material. But suddenly the incubation period comes to an end and we find an autonomous development in the same direction by which cases entirely free from heteronomous influences are affected. Obviously the main cause is here the alteration of the genotype, the hereditary psychic mechanism of phonetic mutation. If this mechanism is the only and exclusive cause acting or effective, the changes are absolutely general and we can speak of a law without exceptions. If other causes counteract and partly triumph, the modifications involved are not general and the law presents a certain number of so-called exceptions. But again the tendency itself is not stifled to death by a partial or even a total failure to act. In a later phase we may see it become operative once more, when as a result of such phenomena as syncope, apocope, etc., new word forms have developed or when new loan words have been introduced in which the phonetic combinations favor the action of the slumbering tendency. These new changes are generally mixed, that is, partly autonomous and partly heteronomous. Van Ginneken gives several illustrations chosen from the history of different languages. In the evolution of English we find during the Anglo-Frisian period a heteronomous palatalization of [k] into [k̂] before palatal vowels, which

were dropped: compare Anglo-Frisian **banki*, **finki*, **drankjan* with O.E. *benc* ('bench'), *drencan* ('drench'), *finc* ('finch'), where *c* stands for palatal [k̂]. This was the first phase. Approximately 300 years later A.-S. [k] before *a* and *o* becomes also [k̂], as may be seen from words like *cealf* ('calf'), *ceastor* ('chester'), *ceafor* ('chafer' = Germ. *Käfer* = 'beetle'), etc. This process is, of course, autonomous, since it is not traceable to the influence of any neighboring palatal vowel. In early Middle English this [k̂] becomes [tʃ] : compare M. E. *chaff* ('chaff'), *cheke* ('cheek'), *chesen* ('choose'). In South England the process went even further and produced [tʃ] when a palatal vowel was preceding instead of following: hence the two parallel forms *to seek* but *to beseech*. This was the second phase. In Modern English we find a third phase in the palatalization of dentals before *j*: compare *nature*, pronounced [neɪtʃə]. Likewise, the West Germanic umlaut was originally a heteronomous phenomenon. It was the outcome of the initial stem accent combined with the disappearance of a following *i* or *u*, and this constitutes the first phase. About 150 or 200 years afterward the umlaut occurs autonomously even in words where *i* was not dropped, or where consonantal combinations had previously resisted the change, or where more than one syllable separated the inducing sound from the induced one; this is the second phase. Again, in a third phase, following a period of rest, the change takes place in numerous analogy cases. It is easy to see that through a succession of various idiokinetic changes the basis of articulation may be shifted, a phenomenon which we meet with in the history of any language.

3. *Cross Variations.*—The third group of differences in biological specimens is that of cross variations resulting from the crossing of dissimilar parents. It is here that Mendel's law is applicable with its twofold principle of segregation and alternation. In the transmission of hereditary characters

the crossbred inherits its genotypical tendencies partly from the father and partly from the mother. These two combining factors are called allelomorphs and give rise to only one feature in the offspring. But in the crossing of the latter with another individual the original two allelomorphs are separated in the germ cells, so that in each subsequent child there will be only one part from the father and one from the mother. Each of these parts may be from the father's or the mother's male or female side. The same process is repeated in every following generation. If the two allelomorphs are identical, for instance, if both contribute the same eye color, the ensuing feature in the offspring will accordingly be the same, and the inherited tendency is said to be homozygous. But if the allelomorphs are different, the inherited tendency is heterozygous, and one of two possibilities will happen: either the resulting phenotype will be a compromise because of the mixture of the two allelomorphs (for instance, the color of the eyes will be different from that of either the father's or the mother's eyes), or one of the two allelomorphs proves stronger than the other and suppresses the expression of the weaker one for the whole lifetime of the descendant. The stronger tendency is the dominant, the other is the recessive one.

If now we consider the case of mixed phenotypes first, we find that the principle of segregation is operative. In the first generation descending from two persons with the same mixed phenotypes only half of the descendants will possess the mixed features, while of the other half some will have one allelomorphic feature, some the other. In a further generation descending from the specimens with mixed features again only half of the descendants will present the mixed characters and the other half will realize one or the other separate allelomorph in a regular proportion. Hence, if one of the pure races were to disappear completely so that no further mixture would be possible, the mixed variety would

eventually die out. The whole situation can be schematically represented by the following chart, in which x stands for one allelomorph, y for the other, and $(x + y)$ for a mixture of the two:

	Offspring $(x+y)$, descending from parent x plus parent y		
GENERATION I	25%x	25%y	50% $(x+y)$
GENERATION II	25%x	25%y	50% $(x+y)$
GENERATION III	25%x	25%y	50% $(x+y)$, etc.

The application of this biological principle is said to be found in all cases of linguistic mixture in the frontier regions of different linguistic or sociological groups. In Alsace people of German tongue tend to nasalize their vowels as in French, and those of French tongue often pronounce voiceless sounds or lenes as in Southern German. The Walloons of Belgium speak French with a sort of German stem accent. Similar conditions prevail in Yiddish, pidgin English, and all creolized languages. Mixtures of this kind are not permanent; they die out as soon as one of the original mixing factors disappears. The phonetic result of such blending may be either that the original sounds of the two languages coexist alongside each other in the mixed product or that new compromise sounds develop which often go back to the original units. Thus, the [y] and [ϕ] sounds, which are a mixture of dental and labial articulation, often return to [i] and [e]. In Spanish the dento-labials [v] and [f] return to bilabial [b] and [(f)h]. Germanic interdental [$\dot{p}$] and [$\eth$], which are mixtures of dental and labial articulation, often develop into the pure dentals [t], [d], or [s]. The Indo-European labiovelars are perhaps products of a similar mixture. The initial accent in Old Latin is the result of a mixture with Etruscan and disappears soon without leaving a trace.

More lasting results are found in the case of two allelomorphs transmitting one dominant and one recessive feature.

Here the principle of alternation is applied, that is, the product shows in the first generation no sign of a mixture, but its heterozygous nature is soon revealed in the following generations inasmuch as it gradually comes to the fore, although heteromixture may slow down the process considerably. And of this too there are many examples in language. The parallelism of phonetic movements after long intervals has often puzzled the linguistic observer. A relationship between such similar movements distanced from each other by several centuries has usually been denied because the parallelism is never complete. Besides, objections have been raised against the claim of a possible connection between the two movements on the ground that the actual racial mixture upon which the phonetic changes were supposed to be based was found to precede the latter by long periods of time. But the present theory shows that these apparently strange facts are accounted for by the recombination of recessive ancestral characteristics and by the truism that in biological transmission the agreement of hereditary features is never synonymous with complete identity. Concrete examples chosen from the history of language are the following: the initial accent of Primitive Germanic is due to a recessive allelomorph gradually manifesting itself after a mixture had taken place long before between non-Indo-European and Indo-European peoples on Germanic territory; this account is confirmed by the fact that various neighbors of the Teutons, such as the Czech, the Irish, and the Lettish, developed a similar initial accent. Likewise, the Germanic sound shifts are due to latent tendencies inherited from other peoples; but here the recessive character went into operation much earlier than in the preceding example, since the action of Verner's law[12] was possible only with a free accent.

The trouble with this theory, as indeed with all the pre-

[12] *Cf.* pages 182, 239.

ceding ones, is that it seems impossible to support it by a sufficient number of unambiguous facts. Despite the optimism expressed by the author of the theory, the written tradition of one or several languages cannot be expected to supply us with such evidence. What would be required for that purpose would be the possibility of experimenting with linguistic mixture. Unfortunately it is not quite so convenient to mix and breed human individuals or types as it is to cultivate beans or breed laboratory animals, nor could we ever hope to survive a number of generations of our subjects of experimentation so as to justify any definite conclusions. It hardly needs mentioning that the numerical proportions suggested by Mendel's law could never be shown to apply to linguistic changes. Nevertheless, that heredity is perhaps a momentous factor in the history of languages has been intuitively felt by various scholars, and further investigations along these lines would undoubtedly be of the greatest interest.

Multiple Causes of Linguistic Change

Of the theories suggested in connection with phonetic change in particular, some are applicable also to other types of alterations. But since they are found to give only inadequate accounts for mere phonetic processes, they are *a fortiori* to be discarded as sufficient explanations of linguistic change in general. It seems most probable that the causality in question is to be looked for primarily in the psychological and social characters of language, and that not one single formula, but only several, can embrace the numerous and complex phenomena.

CHAPTER VIII

CHANGES INVOLVING MEANING

Morphological and Syntactical Transformation

Types of Semanto-Phonetic Change

Genetically all linguistic change is a process pertaining to speech, that is, to semanto-phonetic expression. A sound is not at the origin an ideal entity which may be subjected as such to various transformations or substitutions independently of its practical use in spoken contexts. When we say that Middle English [i·] has become Modern English [aɪ], we mean that in a great many speech experiences the words and sentences containing the sound concerned have been gradually pronounced in such a way that their [i·] part became [aɪ]. It was not until this process had taken place a great many times and in the speaking of many individuals that the *terminus a quo* [i·] and the *terminus ad quem* [aɪ] could be apprehended as two ideal representatives of two ideal phonetic systems and that such a formula as "M.E. [i·] > Mod. E. [aɪ]" could be established. Only when this kind of abstraction from speech had engraphically taken form in the speakers' minds was it possible for one ideal or systematic speech sound to influence another by extra-speech analogy so as to generalize and systematize a sound change throughout the whole vocabulary and speech material of a language. A systematic sound change is primarily the result of a great number of speech experiences, but once it has been ideally abstracted, it can be made productive on a large scale and with remarkable regularity in further experiences of the same sort. This applies not only to individual

sounds, but also to sound combinations and to such phonetic features as stress, pitch, quantity, rounding, unrounding, voicing, etc.

As long as a change can be reduced to an ideal formula in which only meaningless sounds, sound combinations, or sound elements are implied, we speak of *phonetic* change, even though as a result the word or the sentence happens to be affected in its phonetic appearance. Hence, modifications like those occurring in A.-S. *mūs* > Mod. E. *mouse*,[1] A.-S. *flaesc* > Mod. E. *flesh*, etc., are not lexical; nor is the change of Mod. E. *working* into slang *workin'* morphological. But if the formular reduction of a linguistic development involves meaning in some way or other, there can be no longer a question of purely phonetic change. It will be called *morphological* in a broad sense whenever the semanto-phonetic relationship of various constituents of a word has been altered. Examples are the transformation of A.-S. *hús-bonda*, a compound of the two semanto-phonetic units *hús* + *bonda*, into Mod. E. *husband*, a simple word whose original composition is no longer felt; the change of A.-S. *gást-lic*, whose second element was still interpreted as an independently existing word, into Mod. E. *ghostly*, where *-ly* is a mere suffix. Similarly the numerous instances of the gradual loss of final sounds in the flexion of English nominal and verbal forms are illustrative of morphological change, inasmuch as the phonetic apocopation ultimately results in a loss or change of semanto-phonetic entities such as endings and suffixes, thus upsetting the whole morphological structure of the words concerned.

On the other hand, if the formula to which a linguistic modification is to be reduced is in terms of word production or word loss, we are in the presence of *lexical* alterations. Mod. E. *thorough* and *through* are due to different ways of

[1] *Cf.* page 293.

pronouncing the same word but constitute two distinct words in our modern linguistic consciousness. The analogical creation of the verb *enthuse* after such words as *enthusiasm, enthusiast*, etc., represents a lexical change, as does the loss of the word *bōcstaef* which was used in the Anglo-Saxon period for what we now call a letter (Germ. *Buchstabe*). A *syntactical* change is that in which the significant arrangement or the function of smaller language units within larger ones is modified in the course of time. For instance, in Latin, prepositional phrases such as "Misit ad patrem" ('He sent to the father') were analogically extended to sentences and phrases in which the verb should be accompanied by some declensional case of the noun, so that instead of "Dedit patri" we find "Dedit ad patrem" (compare French "Il donna au père"). The development of the relative clause in German "Ich begegnete einem Knaben, der mich fragte" from the paratactic or coördinate structure "Ich begegnete einem Knaben; der fragte mich" is another instance of syntactical change.[2] Likewise, the Latin accusative with the infinitive in indirect discourse was replaced in the Romance languages by a dependent clause introduced by *quod* (Romance *che, que*). This transformed the Latin synthetic sentence structure into an analytic one and could easily become a process analogically productive with respect to syntactical structure in general. In connection with what is called "*semantic* change" it should be remembered that although in the current language of a given period meaning and symbol are bound together so as to form one indivisible linguistic experience, this union is not based upon any natural or so-called intrinsic relationship between symbol and reference. Hence, the course taken in the development of the phonetic make-up of words and sentences may be quite

[2] The origin of dependent clauses in Indo-European is interestingly discussed by Eduard Hermann in *Kuhns Zeitschrift*, Bd. XXXIII, pp. 481–535.

independent of the course of their semantic evolution. The symbol may change while its meaning may remain substantially intact, or vice versa, or both may be modified without there being any connection between the two types of change. It is chiefly the historical study of language that has established beyond doubt this fact of a loose and accidental connection between phonetic sign and what it stands for. Consequently, we speak of semantic change whenever we consider shifts in the conventional meaning of symbols apart from the phonetic modifications that may or may not accompany them. A.-S. *flaesc* symbolized a reference to both flesh and meat, as is still the case with the German word *Fleisch*. That the meaning of Mod. E. *flesh* is more restricted is the result of a purely semantic process. No doubt, the pronunciation of the word too has been modified, but this alteration is entirely phonetic; it has nothing to do with the semantic shift at all.

Folk Etymology

In spite of these theoretical distinctions, it is evident that we shall have to reckon with all sorts of overlapping on the part of what are termed phonetic, morphological, syntactical, and semantic change because of the transitional and mixed character of linguistic facts. A good illustration of this is the phenomenon that goes by the name of folk etymology. It is the result of the popular instinct for associating together words which resemble each other in sound and perhaps in meaning although there is no historical relationship between them. In 18th- and early 19th-century English the word *sparrow-grass* was quite popular as a transformation of the Latin *asparagus* into a compound of which the two constituents were current in the vocabulary of the man in the street. In all cases of folk etymology analogy, whether phonetic, semantic, or semanto-phonetic, reigns supreme. We have seen how words are systematically grouped in clusters in

the speakers' minds. A word that cannot be associated with a certain group of others easily becomes cumbersome because of its psychological aloofness. Hence the popular tendency to fit strange words into clusters of more familiar ones according to accidental analogies. Naturally this tendency finds most excellent opportunities of operation in such words as are borrowed from a foreign language. But the native vocabulary is by no means safe from its influence, provided the words affected were at first not used by the people at large and their true etymologic membership was unknown to them. Folk etymology is found in all languages, though not always in the same degree. English examples are given in great plenty in such works as Greenough and Kittredge's *Words and Their Ways in English Speech*, G. H. McKnight's *English Words and Their Background*, etc. We must content ourselves with only a few, illustrating the nature of the phenomenon. The English words *pantry* and *buttery* are associated with *pan* and *butter*, whereas in reality the former is derived from Lat. *panis* ('bread') and the latter from Late Lat. *botaria* < *bota, butta* ('cask'). *Touchy* is a corruption of *techy* ('faulty, peevish') < O. Fr. *tache, teche* ('spot, blemish'). *Standard* has nothing to do with the verb *stand* but comes from O. Fr. *estandart* > Mod. Fr. *étendard* = 'that which is spread out' (compare Lat. *extendo*). *Cutlet* is not related to *cut* but comes through the French from Lat. *costa* ('rib'). *Cold slaw* is historically connected with Du. *kool* = 'cabbage.' Fr. *choucroute* is a corruption of Germ. *Sauerkraut*. Fr. *vaudeville*, popularly associated with *ville* ('city'), actually comes from *vau de Vire* = 'valley of the Vire', a little river in Normandy, where the so-called vaudeville songs are said to have originated in the 14th century. In German the word *Hängematte* ('hammock'), derived from Span. *hamaca*, is a popular transformation of the latter on the basis of a semanto-phonetic association with *hängen* = 'to hang' and *Matte* = 'mat.' In the same language the

word *Renntier* = 'reindeer' is wrongly connected with *rennen* = 'to race', since it actually goes back to Sw. and Da. *ren* < O.N. *hreinn* = 'reindeer' (compare A.-S. *hrán* = 'reindeer'). Du. *lintworm* = 'tapeworm' had originally no connection with the word *lint* = 'ribbon' but was Middle Du. *lindeworm* = 'dragon.'

A satisfactory classification of all that is termed folk etymology is hardly possible. The course taken by the associative tendency of the popular imagination is extremely whimsical, guided and determined as it is by a bewildering multiplicity of things and facts and their ever-changing aspects. However, one basis of classification is afforded by the relationship in form and meaning between the original correct word and its popular corruption. In this respect we distinguish (1) cases in which the transformation is due to a semanto-phonetic similarity; an example is supplied by the English *buttery* (see above) or by *shamefaced* < *shamefast*, whose primary meaning was 'confirmed in modesty', without any suggestion of facial expression; (2) cases in which the corruption is induced exclusively by phonetic resemblance, as, for example, in English *sparrow-grass* for *asparagus*; (3) cases in which the whole process is confined to a semantic modification, as in the English *by-law*, whose *by-* is semantically associated with the adverb or preposition from which it was originally quite distinct (*by* = 'town');[3] also in the Dutch *hanteeren*, which originally meant the same thing as the English '(to) haunt', '(to) frequent', but which later was associated with Dutch *hand* = 'hand' and came to mean what is symbolized in English by (*to*) *handle*.

Euphemism

Closely related to folk-etymological forms are those linguistic corruptions which are dictated by the innate forces

[3] *Cf.* page 307.

of decency and propriety, of fear, respect, and so on. Symbols referring to holy, harmful, disagreeable, profane things, persons, or actions are modified in order that their appearance may be softened and rendered somehow inoffensive.[4] This phenomenon is known by the name of *euphemism*, from the Greek *eu* = 'well' and *phēmí* = 'to speak.' Euphemisms are frequent in the languages of civilized people as well as in those of savage tribes. At the root of it all is the instinctive belief in the magic power of words. The gap which actually exists between symbol and referent is filled by the superstitious imagination of the speakers; the word is somehow identified with the thing and tabooed for the same emotional reasons as the latter. Euphemistic expressions may assume many different forms, such as phonetic corruption, paraphrasing, lexical substitution, negative instead of positive symbolization, etc. Here are a few typical illustrations, which might easily be multiplied *ad nauseam*. In English death is referred to by such symbols as *the end, dissolution,* and *dying* is replaced by *expiring, breathing one's last. Underclothes* finds a substitute in *underwear, petticoat* in *skirt, sweat* in *perspiration, drunkenness* in *intoxication, dirty* in *unclean, untidy, foolish* in *unwise.* The name of God is avoided and gives way to such substitutes as *Jove, goodness, goodness gracious, gosh, golly, gory, gummie.* The word *Jesus* is distorted to *gee whiz, Jerusalem, gee whillikens, jimmie,* and others. Especially in oaths the euphemism acts as a godsend. Thus *darn* takes the place of *damned, all-fired* stands for *hell-fired, the deuce* for *the devil.* In German *Potz* instead of *Gott* forms the first constituent of many a compound; compare *potztausend, potzwelt, potzsapperment.* The word *Sakrament* is changed into such forms as *Sapperment, Sackerlot*; *Christus* becomes *Kreuz* in *Kreuzdonnerwetter*; *Heiliger Gott* ('holy God') degenerates into *Heiliger Bimbam, Heiliger Strohsack.*

[4] *Cf.* pages 82, 83.

In French we have *bleu* instead of *Dieu*; compare *parbleu* (*'par Dieu'*), *corbleu* (*'corps Dieu'*), *morbleu* (*'mort Dieu'*), *sacrebleu, sacredié* (*'sacré Dieu'*).

Morphological Change as Secondary Interpretation of Phonetic Change

The course taken by linguistic behavior in the production of morphological alterations in individual words as well as in the mechanism of language itself is manifold. As a rule it is not at all a morphological modification as such that is aimed at. What happens is, for instance, that through the action of various forces purely phonetic changes and coincidences are gradually apprehended as sufficiently recurrent to symbolize some incremental reference which was formerly not deemed worth expressing or which was symbolized by means other than morphological structure; or, reversely, gradual phonetic loss results in the destruction of the phonetic support of some referential increment which henceforth remains without symbolization or finds expression in a nonmorphological way, such as syntactical construction, relative sentence stress or intonation, the use of auxiliaries, adverbs, etc. In either case the resourceful speaking community simply makes the best of a situation that is forced upon it by the relentless action of phonetic change. To choose one example from among scores of others: the nouns *foot, tooth, mouse, louse, goose, man* today symbolize their plural by a mutation of the vowel of the stem, whereas formerly they used to have endings to take care of the categorial function of number. At the origin this vowel change was nothing but a case of assimilation without any semantic significance. Its morphological value arose only when the plural endings had been lost as a result of phonetic evolution. Thus it happens that entire declensional and conjugational systems disappear from usage or are replaced by others or by nonmorphological constructions.

Absorption of Part of the Radical by the Affix

Somewhat different is the process by which an integral part of the radical gradually comes to be looked upon as belonging to the nonradical element. Our Mod. E. *pea* is derived from Lat. *pisa* and was in the Old English period *pise*. In Middle English its plural is found as *pesen* or *peses*, which clearly shows that the singular should not be *pea* but *peas(e)*. As a matter of fact, such a form still remains in existence with a collective meaning. But when the old plural ending *-en* was lost, *pease* was felt as a plural, and a new singular, *pea*, was introduced. Similar processes are very numerous in the history of language. In Dutch the suffix *-ing* is used in the derivation of nouns and gives rise to words of the type of *edel-ing* ('nobleman') from the adjective *edel* ('noble'). But in analogy with derivatives in which the *l* actually belongs to the stem, we soon witness the emergence of such words as *hoveling* ('courtier') from *hof* ('court'), *ellendeling* ('villain') from *ellende* ('misery'), etc., where the *l* is obviously interpreted as part of a new suffix. If the French of today have no objection to giving the feminine form *vaurienne* to the compound *vaurien* ('good-for-nothing'), in which *rien* is etymologically an independent word incapable of formal differentiation as to gender, it is because the latter part of the word, *-ien*, is interpreted as an adjective-nominal suffix after the analogy with such words as *musicien–musicienne*, *Parisien–Parisienne*, etc. I remember seeing an advertising sign of a pedicurist exhibiting the word *pédiceur*, thus betraying that the *-ure* of *pédicure* had been taken for the suffix found in words like *horticulture*, *coiffure*, and others.

Absorption of the Affix by the Radical

The reverse happens when integral parts of affixes are gradually incorporated into the radical, so that the derivative

character may become completely lost. That words like *worship* and *height* were formerly understood as derived from the radicals *worth* and *high* by means of the suffixes *-ship* and *-th* is hardly realized today by the average speaker; and who besides the etymologist would suspect that the verb *to fret* is of the same origin as the German *fressen* and consists of the intensive prefix *for-* and the verb (*to*) *eat*, or that the noun *glove* is derived from a word *lof* meaning 'palm of the hand' and the prefix *ge-*? Even the components of regular compounds may become so thoroughly amalgamated that they appear as simple words. *Sheriff* was in Anglo-Saxon *scīr-gerēfa*, where *scīr* corresponds to our modern *shire* and *gerēfa* to M.E. *reve*, a high administrative official. *Woman* is a hidden composition of *wife* and *man*, *husband* of *house* and *bond*, *gossip* of *god* and *sib* ('peace, relationship, friend'), *elbow* of *eln* ('arm') and *bow* ('bend'). A comparison of the preterit of the verb *to have* in Gothic with that of Modern English is especially illuminating: (*I*, *you*, *he*, *we*, *you*, *they*) *had* was in Gothic represented by the forms *habaida*, *habaidēs*, *habaida*, *habaidēdum*, *habaidēduþ*, *habaidēdun*, not to speak of two additional forms for the dual number. Of course, English is not a continuation of Gothic, since the latter belongs to the group of East Germanic dialects. But Gothic is the oldest form of Germanic of which we possess documents of some consequence, and it is very likely that had we any Anglish or Saxon records from the 4th century A.D., we should find forms just as elaborate as the Gothic ones above given. Indeed, even in Anglo-Saxon they were still complicated and numerous enough in comparison with our single *had* for all persons: compare A.-S. *haefde*, *haefdes(t)*, *haefde*, *haefdon*, *haefdun*, *haefdon*. The loss of morphology resulting from phonetic corrosion often necessitates the substitution of syntactical constructions. What was expressed in the one morphological word *sokidēdjau* in Gothic requires the four words 'I should have sought' in English. Curiously enough,

such a syntactical construction may in its turn develop into one morphological word. The future of Modern French verbs (for example, *chanterai*) is an amalgamation of what was in Vulgar Latin the infinitive of the verb concerned and the present of *habere*, 'to have' (for example, *cantare habeo*), and this latter syntactical combination itself had been previously substituted for the morphological future *cantabo*. Sometimes the loss of consciousness in regard to linguistic derivation has resulted in the emergence of forms with two or more cumulative affixes of which one or more are no longer felt as such. Thus, the English *children* contains three suffixes of the plural, namely, *-(e)r*, *-e*, and *-(e)n*. In Middle English of the 13th and 14th centuries we also find *calvren*, *lambren*, and *eyren* ('eggs'), and in Modern Dutch the plurals *kinderen*, *eieren*, *kalveren*, *lammeren* are still the only forms in use. Likewise, the final *n* of Dutch *teen* ('toe') and *schoen* ('shoe') was originally a plural ending, whereas today it constitutes part and parcel of the singular stem.

Analogical Leveling Out

When two or more different systems of morphological symbolization are used in a language with regard to the same referential increment, it is quite common that their identity of meaning tends to produce identity of symbolization either in individual words or systematically throughout. In English, for instance, the past tense of verbs is symbolized either by a dental ending (*work–worked*) or by an alternation of the stem vowel (*find–found*). Hence it was possible for the preterit of the verb *to help*, which was in Old English *healp* for the singular and *hulpon* for the plural, to become *helped* after the analogy with verbs of the weak conjugation. Reversely, *to spit*, *to dig*, and other verbs which were formerly weak are now conjugated according to the strong type. In the case of nouns we find that the various morphological devices formerly used to symbolize the plural (the endings *-e*,

-en, *-es*, *-er*, vowel mutation) were in the course of time replaced by one, namely, the addition of *-s*. Only a few fossilized relics such as *oxen*, *kine*, *feet*, *children*, *mice*, etc., testify to the former greater variety of symbols in the expression of the plural.

Change in Structural Interpretation of the Same Symbol

Nor does the same nonradical symbol necessarily symbolize the same incremental reference during the whole of its lifetime. From a phonetic point of view the morphological make-up of a word may remain unchanged while its significant structure is completely modified. In the English adverb *nowadays* the *-s* element was at the beginning a genitive ending of the noun *day*; at present it is interpreted as an adverbial suffix.

That many affixes were once independent words capable of entering into compound formations of the type of *firebox* has been pointed out before. Thus, *-hood* in *childhood*, *-fast* in *steadfast*, *-ly* in *lovely*, and many others were words before they were reduced to the function of derivational elements. It is perhaps less generally realized that the incremental aspect of an affix may also become semantically radical. This is exactly what happened to the diminutive suffix *-unculus* in *avunculus* when it became *oncle* in French.

Borrowing

Furthermore, borrowing may become a source of extensive morphological innovations. This is best illustrated by the number of productive affixes of Romance origin in English. The prefixes *com-*, *con-*, *co-*, *ex-*, *e-*, *extra-*, *in-*, *im-*, etc., or the suffixes *-able*, *-ade*, *-age*, *-cy*, *-sy*, *-ess*, *-ism*, *-icism*, *-ist*, *-ry*, and scores of others of French, Latin, or Greek origin are all more or less alive in our present-day language. But here too the immediate objective of the borrowing is not the introduction of new morphological processes. It always

starts with purely lexical mixture, which eventually becomes so general and widely spread that the morphological structure of many of the new words is realized by the community and can thus be exploited systematically in further word formations.

Syntax Affected by Morphological Change

Just as the morphological status of a word or of a language is slowly revolutionized by phonetic evolution, so the changes in morphological structure must in their turn seriously affect the combining procedures in the construction of the sentence. Of course, it is not uncommon that a disappearing derivational form is replaced by nothing in the way of systematic formulation: the dual number and the nominal gender have left scarcely any trace in the structural or syntactic mechanism of the English language; it may also happen that the loss of one morphological form finds a substitute in another, as was the case when the plural endings *-er*, *-e*, *-en* were replaced by *-s*; but in many instances the loss of morphology creates the need of syntax, so that the reference that was once symbolized by a nonradical element now finds expression in some formular construction or in some standardized process of sentence structure. The extinction of declensions and of much of the old conjugation has been instrumental in English in the spreading of prepositional constructions, of auxiliaries, or of a significant system of word order. Although morphology and syntax are quite distinct logically, it would be easy to argue that numerous cases of change in language share the nature of the two. Considered from a certain point of view, deflection is a purely phonetic phenomenon, from another it is a morphological loss, and from still another it may mean a syntactical innovation. Morphology means synthesis, syntax means analysis, and languages are being distinguished according as they emphasize one or the other. Although Anglo-Saxon was still synthetic to a large degree, Modern

English turns out to be highly analytic. The entire morphological and syntactical appearance of a language may eventually be upset by the slow accumulation and the systematic generalization of a great many minor alterations which were purely occasional and perhaps phonetic in origin.

Generally speaking, the process of syntactical transformation is considerably slower than that of phonetic or even morphological change. In due time, however, every feature and unit of syntactical expression may be affected. We find that formulae arise from free constructions or that they are eventually treated as compound words. *Breakfast* was once a free construction in which *break* was a verb and *fast* a noun comparable to any odd noun used in connection with the same verb. Hence it was possible to say "They broke their fast."[5] Today the word is felt as one unit, of whose composition the ordinary speaker is not even aware and which is subjected to the customary system of verbal inflection or substantival changes and to the syntactical treatment characteristic of verb and noun. On the other hand, a form like O.E. *Ic name* is today 'I should have taken', and O.E. *luflīce* must nowadays be rendered by some such paraphrase as 'in a lovely manner.' The fact that expressions like *to church, to school* have become formular is partly responsible for the elimination of the article and precludes the possibility of modifying the nouns *church* and *school* by any adjective. In other words, the syntactical treatment of these word combinations has been altered. The disappearance of the Old English declensions has resulted in innumerable syntactical shiftings inasmuch as certain case objects were transformed into prepositional phrases. Intransitive verbs have become transitive, and much that used to be adequately rendered by endings or affixes is now expressed by a stiffer and more systematized word sequence. Clauses which were formerly

[5] Sir Walter Scott, *Marmion*, I, xxxi: "And knight and squire had broke their fast."

coördinated to each other are now felt to be hypotactic. Whereas in many of its uses the adjective used to be distinguishable from the noun by its mere form, it is now identifiable only by its relative position or by circumstantial inference when used in actual speech combinations. *A priori* it is impossible to say whether *paper*, *stone*, *cut* are nouns, adjectives, or verbs. Of the formal agreement of adjective with noun in number and gender nothing has remained. Inversion, or the position of the verb before the subject in main clauses, was a very common feature in Anglo-Saxon; in Modern English it is exceptional.

This enumeration of syntactical changes might be extended indefinitely, but little would be gained from the point of view of fundamental understanding. Unfortunately, it is not yet possible to formulate the general laws that are thought to rule the drift of syntactical features. It is easy enough to specify analogy as one of these laws, as some kind of analogical influence can be shown to operate in all changes of structure and combination; but we have had previous occasions to learn that analogy is at most a procedure, a method of change, not a cause. Nor is linguistic mixture with its accompanying phenomena of loaning and borrowing more than a circumstance favoring the action of more fundamental forces. The complexity and subtleness of syntactical phenomena are so great that their study has been unduly shunned in favor of the other facts of linguistic history.

The Story of Words and Meanings

System Words Affected by Lexical Change

In dealing with lexical changes it is well to remember that reference is made to the word as a systematic unit, not as an element of actual speech. In speech, of course, the word is continually subjected to more or less thorough adaptations affecting both its phonetic and its semantic complex, even

to the extent of upsetting its structure as a semanto-phonetic unit.[6] The occasional and creative adjustments of the word to the changing needs of the sentence, although they themselves are merely transitory, are instrumental in the development of systematic changes of the static word. It is a slow process, like all linguistic processes resulting in the crystallization of new forms. But if we compare the vocabulary of a language during a certain period of its history with that of another period, we immediately realize that the external appearance and the significant value of the words have been altered. There is no objection to calling this "a change in the vocabulary" provided that we are not misled by the terminology thus used. The so-called vocabulary of a language is not a collection of words in the same sense in which a forest is a collection of trees. Trees are objects which exist outside of the observing subject; independently of the latter they may assume various colors, sizes, and shapes. The static word is essentially a psychological habit of symbolization and reference whose seat is in the human mind itself. A change in the vocabulary is therefore nothing but a change in the symbolizing and referential habits of a group of human beings.

Phonetic and Semantic Changes not Interdependent

Used in the sentence, the system word forfeits its unity inasmuch as symbol and reference are torn asunder and no longer overlap.[7] If, then, the principal channel of word alterations is the spoken sentence, it is natural that the modification may and usually will affect the symbol and its reference independently of one another. Hence, the phonetic history of a word and its semantic evolution do not go hand in hand: one may be slow, the other fast; the symbol may be shortened while the referential range is widened or

[6] *Cf.* pages 119*ff.* [7] *Cf.* page 120.

vice versa; one may undergo a considerable transformation, the other may remain substantially the same. There may be no relationship whatsoever between the phonetic change on the one hand and the semantic on the other; compare the Middle English symbol *mūs* with the corresponding Mod. E. *mouse*, whose referential contexts have remained generally unaltered.[8] The conditions under which the phonetic part of words is modified have been studied in a previous chapter; how and under what circumstances the referential contexts of words are shifted we shall examine in the later sections of this chapter devoted to semantic change. In the meantime our attention is still claimed by the loss and the rise of words, two phenomena which are purely lexical inasmuch as they concern the lot of the static word as a unit.

Loss of Words

It is commonly known that certain words fall into desuetude: they become obsolete or disappear entirely from the working vocabulary of the community. Even during a person's lifetime this can be noticed. Grandparents often use words or expressions which their grandchildren find strange because the younger generation has dropped them or replaced them by others. The fact becomes much more striking, however, if we compare the vocabulary of writers of former times, for instance, of Shakespeare, with that of today. It is only natural that the removal of objects, institutions, concepts, etc., from the sphere of interest or from the social life of a community entails the loss of the symbols that used to designate them. To be sure, this is not inevitable, as another alternative is that the surviving symbol assume a different meaning. But words like *angel*, *marcus*, *harrington* (= various old English coins), *gambeson*, *surcoat* (= certain medieval garments), *galleon* (= sailing vessel of

[8] *Cf.* page 278.

the 15th and following centuries), *sewer* (= an officer who set on and removed the dishes at a feast), and hundreds of others are dead today as far as our present living vocabulary is concerned. They are resuscitated as names only by the historian who describes the conditions of the past. Furthermore, it may be said that in the long run a language has no use for synonyms whose meanings are not sufficiently diversified to make it worth while to preserve them both. The community will either tend to reserve one word for a certain shade of meaning and its synonym for another or it will eliminate one of the two. The A.-S. *guma* (compare Lat. *homo*) has had to withdraw before the greater aggressiveness of *man*. The general oblivion in regard to *guma* has become so complete and final that even in a fossilized form like the second element of *bridegroom* (A.-S. *brydguma*) popular etymology has replaced it by *groom* (= 'youth'). The rivalry between the word *army*, borrowed from the French, and the O.E. *here* ended in the complete victory of the former, so that only historical analysis can point out the survival of the native word in the first part of *harbor*, *harbinger*, *to harry*. Similarly *sake*, originally meaning 'a contention at law', has been expelled by the foreign *cause* except in the formular combination with the preposition *for*. On the other hand, homonymy, or the sameness of name with difference of meaning, occasionally ends in word loss. Goethe still used the word *englisch* in the sense of 'angelic, like the angels', whereas nowadays its phonetic coincidence with *englisch* = 'English' has brought about the obsoleteness of the former. It is not easy to diagnose all these cases so as to formulate the reason or reasons why one word is dropped while another is kept with a differentiation of meaning; why sometimes only a slight semantic difference saves the life of a synonym whereas even considerable diversification cannot stop the loss of another; why the preference is given to this one of two synonyms rather than to that. If we look for logical accounts

of these processes, we shall almost invariably be disappointed. It is rather a question of emotive attitude on the part of the speaking community. The feeling of analogical relationships, a tendency to modish imitation with all its whimsical tyranny, aristocratic sophistication, superstitious sentiments, prudish inclinations, conventional chivalry, literary pedantry, and various other factors of a most unlogical type continually interfere with the destiny of words. Sometimes the disuse into which a word is driven by these forces remains confined to special social groups without penetrating into the crowd; in other cases the vocabulary of the community as a whole is affected. Not long ago, before a new fashion had familiarized the world with women's legs, certain members of the so-called refined society shunned the word *leg*, which was to be replaced by *limb*. Because the sacred word *Yahweh* was not to be pronounced by the Jew, the Hebrew tetragrammaton YHVH (*Yod, He, Vau, He*), being the consonantal part of the word, was given the vocalization of *Adonai* ('Lord') or of *Elohim* ('the gods') so that *Yehovah* or *Yehovih* resulted as a substitute. Words like *stink*, *sweat*, *puke*, *whore*, and many others never pass the lips of a large class of English-speaking people, while some more offensive ones even refuse to be written down.

Rise of New Words

In any community culturally autonomous and progressive the number of words that drop out of circulation is bound to be more than offset by the new additions to the nomenclature of the language. The modern English vocabulary is immeasurably richer than that of the Anglo-Saxons. Innumerable new concepts and things have found labels. The progress of scientific research and its application to domestic and public needs, the adaptation of thought to the ever-changing conditions of man and his universe, the greater facility with which the many peoples of the earth are brought

into mutual contact, the amazing proportions commerce and industry and their marketing facilities have assumed, the world-wide influence of the written word with its popularizing effect, the growing democratization of education, all these factors and many others have contributed to enriching the current vocabulary of the masses. Many of the new terms never go beyond the limits of comparatively small groups of specialists; others find their way to general currency. Words like *tuberculosis, typhoid, pneumonia, appendicitis, diagnosis, heredity, vitamins, hypnotism, oxygen, hydrogen, locomotion, telephone, radio, airplane, quality, quantity, essence,* and thousands of others were once more or less technical terms used by only a few.

Then, the need of differentiating synonyms, which happen to crop up in all kinds of quarters, is responsible for the naturalization of new words. The English language particularly has had to deal with synonyms on a large scale, as foreign words were introduced in great numbers at various periods. *Stool* and *chair, head* and *chief, sympathy, compassion,* and *fellow-feeling, learned* and *erudite, behead* and *decapitate, sharp* and *acute, book* and *volume, shady* and *umbrageous, fire* and *conflagration* are just a few illustrations. A mere bifurcation of meaning may cause the same word to split into two homonyms each of which is eventually interpreted as independent of the other; compare the words *ball* = 'a toy' and *ball* = 'a dancing entertainment.' Moreover, if a word becomes taboo, a substitute charged with less superstitious tension is coined or borrowed from some source or other. Thus *Yehovah* took the place of *Yahveh, perspire* has been largely substituted for *sweat, contradict* has replaced *withsay* and to some extent *gainsay.*

Outright Creation

In regard to the methods of word production the speakers of the various languages show the greatest resourcefulness.

At the beginning of human speech, when no phonetic system had yet developed and morphological patterns did not exist, the number of outright creations must needs have been great. The imitation of natural sounds and movements as well as the spontaneous expression of emotive attitudes must have given rise to all sorts of onomatopœias, reduplications, and interjections. It is impossible, however, to obtain an adequate picture of what these primitive words or sentences were. As far as we can trace language historically, creations in the true sense of the term do not occur. All that is commonly quoted as illustrative of such a primitive process consists in reality of words which were at least dependent upon the phonetic system characteristic of the language concerned. In the 17th century the Dutch chemist van Helmont invented the word *gas*;[9] but not only did the Greek χάος serve him as a suggestive example, the word also consists only of such sounds as were familiar to the inventor as a Dutchman. Never would he have been successful in having the word adopted in his country if he had ventured to coin a term containing the English *th* sound, for example. To be sure, *gas* became an international term, but it assumed in each language a pronunciation in keeping with the prevailing phonetic customs. A similar comment could be made upon the Dutch word *fiets*, meaning 'bicycle', whose origin, relatively recent, is completely unknown. Perhaps it is an onomatopoetic adaptation; at any rate its phonetic make-up conflicts in no way with the Dutch system of sounds and word patterns. Sometimes the vocabulary of infants is pointed to as a treasure house of lexical creation. Indeed, during the first stages of speech, when the babbling period has been passed, a child often builds up words of its own which it takes all the

[9] *Cf.* J. B. van Helmont, *Ortus Medicinae*, ed. 1652, p. 59a: "habitum illum gas vocavi, non longe a chao veterum secretum." That van Helmont intended the word to be pronounced in the Dutch way, that is, with an initial guttural fricative, is indicated by his mention of the Greek word which begins with χ(= [x]).

skill and ingenuity of a mother to understand. When two such children are brought up together, they have been known to work out some sort of jargon which allows them to exchange in a most original fashion the many experiences of joy, sorrow, surprise, enthusiasm, of their young lives. On closer examination, however, a great many of their words prove to be imperfect imitations and adaptations of what they have heard from adults. Many examples of this are found in Clara and William Stern's *Die Kindersprache* or in Rudolf Meringer's *Aus dem Leben der Sprache.* Thus "tita," meaning 'clock', stands for *tic-tac*; "ham," meaning 'a roll', stands for *ham-ham*, an onomatopoetic reduplication used to describe the gluttonous eating by a dog; "gn-gn," meaning 'to drink', is traced back to the nasals of *trinken*; "papů," meaning 'to eat', comes from *Papperl* (= 'pap'). There is good reason to believe that were it not for the difficulty of interpreting the child's psychology as to its initial reactions, many more if not all of these naïve inventions could be accounted for by imitation.[10] As far as our own current onomatopœias and reduplications are concerned, a considerable number of them have acquired their imitative character only as a result of fortuitous developments, while others are manifestly mere modifications of otherwise existing word stems.

Composition and Derivation

Creations in the broader sense, that is, such as are built up with material supplied by the existing phonetic and morphological stock of a given language, are very common. In the first place we may mention the methods of composition and derivation, which are resorted to with great predilection in some languages, with less enthusiasm in others. The

[10] See also Milivoj Pavlovič, *Le langage enfantin. Acquisition du serbe et du français par un enfant serbe*; Clara and William Stern, *Die Kindersprache*, p. 386. See also on page 100 of this book.

analogy of existing patterns determines the particular kinds of compounds and morphological words that are thus constructed.[11] In the scientific world the custom has come to prevail of building up new words with the material furnished by Latin and Greek. As such words are likely to be rather long, the so-called *clipping* process is frequently applied,[12] especially if they happen to become popular. *Auto* is today more readily used than *automobile*, *mob* has completely superseded *mobile vulgus*, *bus* stands for *omnibus*, *gin* for *geneva*, *kilo* for *kilogram*, *zoo* for *zoological garden*, *pro and con* for *pro and contra*, *prof* for *professor*, *doc* for *doctor*. A large number of pet names and of slang words illustrate the same process: *Ned*, *Ted*, *Tom*, *Will*, *Moll*, *cab* for *cabriolet*, etc. A type of word which has become very popular in modern times is the so-called *letter word*: the initial letters or syllables of a series of words are so put together as to supply a new unit. In Dutch the British Empire is sometimes referred to as the "Anziac family" (Australia, New Zealand, India, Africa, Canada); "Socony" stands for Standard Oil Company of New York, "Hag" in *Kaffee Hag* contains the initials of Hamburger Aktien Gesellschaft, "T. B." is a euphemism for *tuberculosis*.

Word Borrowing

Then, of course, there is the borrowing method. Loan words are found in all languages, although the hospitality shown them is not the same all over the world and even in the same tongue the behavior proves to vary a great deal from period to period. In more ways than one the study of loan words is instructive. They not only reflect the greater and less intercourse between different peoples during their history, but they also emphasize the particular fields in which the loaning people was superior to the borrowing one at a

[11] *Cf.* pages 137–40. [12] *Cf.* page 244.

certain time. The importation into English and other languages of a number of Italian musical terms such as *allegro, piano, violoncello,* etc., would not have been possible had it not been for the popularity of Italian music outside of Italy. In the 15th and 16th centuries Holland was a great naval power, and as such she came into intimate contact with Great Britain; hence a number of Dutch nautical terms in our vocabulary: *boom* ('beam'), *skipper, orlop, yacht.* The influence of Dutch painting is shown in such words as *easel, etch, sketch, landscape.* The presence of many French culinary terms in English testifies to the appreciative attitude of Englishmen toward the excellence of the French cook, and terms of French origin dominate also the vocabulary of dress. And so we find many signs of cultural influences in the vocabularies of the different languages.

The vicissitudes of the English people and their language have brought them into relation with almost every civilization of the world, and of all the European tongues English has the most complex and colorful vocabulary. As long as a foreign word is used only by the learned classes, it is apt to escape, to a certain extent at least, the phonetic and morphological laws of the borrowing language. Words like *radius* and *thesis* are given an English pronunciation but form their plurals *radii* and *theses* in the Latin and Greek ways. The more popular such words become, however, the more they are handled as though they were natives. Hence we get changes like *priest* from the Latin *presbyterus, church* from the Greek *kyriakón* ('the Lord's house'), *bishop* from the Latin *episcopus, catch* from Picard *cachier* (Vulg. Lat. **captiare*). Even inflected forms come to be interpreted as ordinary nouns: *bus* is the last part of *omnibus,* a dative plural meaning 'for all'; *dirge* is from the Latin *dirige,* an imperative occurring at the beginning of an antiphon of the mass for the dead—"Dirige, Domine meus, in conspectu tuo viam meam."

The wanderings of words may be extremely bohemianlike, starting out from one language and passing through various others before they reach us. In English the word *boss* is an Americanism, but the Americans borrowed it from the Dutch *baas*. *Apricot* seems to be originally a Vulgar Latin word *praecoquum* (*praecox* = 'precocious, early ripe'). The Greeks adopted it and carried it to the Arabs, where it took the form *al-barqûq*. Then the Romance languages took hold of it, and through the French it finally landed in England. Not seldom the emigration of a native word is followed by a later re-immigration to its country of origin, in which case the more or less long sojourn abroad naturally transforms it a good deal. The German *Spion* comes from the French *espion*, but the Romance people had previously borrowed it from the Germans (compare O.G. *spëha*). Moreover, a word may be borrowed several times, at different periods, through different channels, from one foreign language or from several cognate or entirely different ones. Words of this sort are known by the name of *doublets*, and both their meanings and their forms offer clear signs of their different treatment in accordance with the particular circumstances of the borrowing. *Chieftain* and *frail* are Old French loans to Anglo-Saxon, while *captain* and *fragile* have been handed over to us by Modern French. *Loyal*, *legal* and *leal*, *royal*, *regal*, and *real* (a Spanish coin), *chattel* and *cattle*, *gentile*, *gentle* and *genteel*, *dainty* and *dignity*, *gállant* and *gallánt* are additional examples. *Skirt*, of Scandinavian origin, is a doublet of the English *shirt* and is etymologically connected with *short* (Vulg. Lat. *excurtus*). Both the French *dîner* and *déjeuner* come from the Vulgar Latin * *dis-junâre* ('to break fast'), the difference being that *dîner* represents the infinitive while *déjeuner* goes back to a third-person singular of the present indicative (* *disjúnat*). Another peculiar way of borrowing consists in translating the foreign term. When the Germans coined *Einfluss*, they translated the

Latin *in-fluentia*; *Eindruck* is a replica of *im-pressio*, *Ausdruck* of *ex-pressio*. In English we have *almighty* from the Latin *omnipotens*, *grandfather* from the French *grand-père*. The Americans obtained *warpath*, *paleface*, *firewater* by translating Indian words.

Finally, we must mention that the source of loan words is not necessarily a foreign language. Dialects, slang, technical or group languages, nay even the borrowing language itself as it was during some period of the past, may be called upon to supply fresh material. Words like *nincompoop*, *hoax* ('hocus-pocus') were originally slang phrases; *hazard* (Arabic *al-zar* = 'the die') and *chance* (Late Lat. *cadentia* = 'the fall of the dice') used to be technical gaming terms; and *humor*, *temperament*, *complexion* come from the special vocabulary of ancient physiology. *Gloaming* is a Scottish and Northumbrian word which Standard English has annexed. Words like *fad*, *grouch*, *stingy*, *uncanny*, *spree*, *greed*, and many others are of dialectal origin, while *whit* and *wight*, *through* and *thorough* are illustrations of doublets developed within the English language itself under different circumstances.

Origin of Meaning

We can have no empirical knowledge of the manner in which at the beginning of human speech a physical context between extralinguistic experiences and certain sound combinations gave rise to a corresponding psychological context, thus bringing about the first genuine language phenomenon in the form of a semanto-phonetic unit. This can be put more simply by saying that no empirical knowledge can be obtained as to the manner in which meaning came into being. The period of original language-making as it emerged from a completely nonlinguistic past is irrevocably gone by and remains forever hidden in the darkness of prehistoric events. Only a selective analysis of presently observable

processes allows us to make comparisons and to draw analogies by means of which some faint light can be thrown upon the primitively groping beginnings of speech, provided always that the axiom of the fundamental sameness of human nature throughout the ages is not in danger of being challenged. All our possible observations as to the genesis and the meaning of meaning in language have to reckon with a more or less thorough refraction of the semantic facts from their purely logical or psychological prototypes through the prism of a highly complicated system of symbolization. A change of meaning is identical neither with a change of thought nor with a change of extrasemeiological experience. The fact that the meaning of Engl. *flesh* has been modified in the course of time does not indicate that the English people accordingly began to distinguish between 'meat' and 'flesh' while formerly they did not. Theoretically at least, thought and experiences may come, rise, and disappear irrespective of whether and how they might or will be symbolized by means of articulate sounds, but every "meaning" is fatally bound through intricately though conventionally associative ties to systematized clusters of symbolic sounds. Every new concept or experience seeking linguistic expression can find it only by submitting to a more or less disfiguring metamorphosis of itself into "meaning." As soon as such a concept or experience knocks at the door of language, it is offered a set of phonetic molds with many semantic connections traditionally established, from which it can choose the least distorting ones and which it must handle according to strictly exclusive and conventionalized procedures. Hence, what is called a change of meaning is essentially a semeiological phenomenon, always implying that a linguistic sign or symbol is contextually linked to what it refers to or signifies. If, nevertheless, the semantic development in language follows one way and the phonetic change another, it is because the symbol owes its specific character and features to circumstances entirely

different from and independent of those which determine the make-up of its corresponding meaning.

Semantic Change a Socio-Psychological Fact

Furthermore, the semantic change can be correctly understood only if we remember that meaning, as well as language in general, is not a thing that exists outside of the human mind. The members of purely physical contexts do not become significant with respect to one another until they are converted into members of psychological contexts and unless these are more or less the same for the hearer and the speaker. In the mind of each representative of a language certain sound combinations have been habitually linked to certain references, emotions, or intentions, and this linking has been effected under the guidance of the referential habits of all the other individuals with whom he has come into contact, while the semeiological contexts of these others have in their turn been governed by those of all the speakers with whom they themselves have had intercourse, and so on. The relatively static meaning of a symbol is the resultant of the interaction of the psychological contexts of many individuals in regard to relatively identical symbols and meanings. Hence, when we say that the symbol *flesh* has changed its meaning, we do not want to convey that by an innate force of its own the physical sound combination has acquired a different signification which the speaking community is simply obliged to register passively and to make the best of in the use of language. On the contrary, the implication is that in the course of various psychological processes the speakers themselves have altered their habitual contextual linking of sound and reference. Although this seems quite evident, the mistake is often made that meanings are thought of as something, happening somewhere in the universe, of which the individual or the community is simply the astonished witness. Meaning and its change are of a socio-psychological

character; their nature and laws can be understood only on condition that we understand the nature and laws of the human mind considered both individually and socially, in its creative as well as its receptive function.

Semantic Change Genetically a Product of Speech

The genesis of meaning is to be looked for in the sentence, that is, in the first endeavors of men to act upon one another by means of language. In so far as meaning was the creation of one individual, it was occasional and ephemeral; but according as more or less the same sounds were repeatedly connected with more or less the same meaning by a gradually increasing number of intercommunicating people, a meaning became a crystallized process of a relatively static nature. Owing to the associative, differentiating, identifying, analyzing, compounding, creative, reproductive faculties of the human mind this relatively constant meaning is uninterruptedly subjected to numerous subtle adjustments in the spoken sentence. Again, these temporary adjustments or occasional semantic changes may, by frequent repetition and imitation, become relatively static. Hence, change of meaning can be kept going only because of the renewing and regenerating power of the living sentence, that is, in a language that is being spoken. The spoken sentence is the only primary, fundamentally necessary medium of semantic change. All the other causes and means, however productive they may be, are only secondary and subordinate; without the constant crystallization of occasional meanings into static ones through the sentence the supply of fixed meanings would soon stop and the other means of semantic change would become sterile for lack of material to act upon. Moreover, a changed meaning not immediately due to the sentence must needs remain individual unless it finds its way to stability and general currency through the medium of speech, that is, of the sentence.

Semantic Clusters

We have seen that in language phonemes and phonetic, morphological, syntactical, and semantic combinations form more or less compact clusters.[13] It is a natural characteristic of such clusters that a change in one member affects somehow the others. In the semantic field this may be illustrated once more by the reference of our Mod. E. *flesh* as compared with A.-S. *flaesc*. The meaning of *flaesc* was contextually defined, as that of Germ. *Fleisch* still is today, by the prevailing references of such cluster symbols as *blood, skeleton, nerves, muscles, mind, soul,* etc., on the one hand, and such meanings as *fish, vegetables, bread, beverage, bone, porridge,* etc., on the other. When in consequence of various circumstances, which we need not describe here, a new referential unit was introduced into this cluster, namely, that which is symbolized by *meat* in its modern sense, the contextual grouping of *flesh* was thoroughly changed, inasmuch as the references *fish, vegetables, bread, bone, porridge,* etc., thenceforth clustered around *meat* but no longer around *flesh.* The meaning of the latter had changed as the result of a modification in the systematic contextual clusters to which it belonged.

Semantic Borrowing

It has also been pointed out that meanings, or rather special referential fields, are borrowed from foreign tongues, dialects, or various group languages; that is, a symbol which at one time was in context with a certain native reference is enriched by the addition of a new referential complex borrowed from an exotic source owing to analogy. In German the word *Kunst* is related to *können* whose basic reference was at first 'to know'. Hence *Kunst* had the same meaning as

[13] *Cf.* pages 104–12.

'knowledge', 'science.' Later its referential aggregate came to include also 'craft', 'skill', 'wisdom', 'handicraft', 'power', etc. But although this development might have come about by a native process, it is probable that some of the new meanings are due to the influence of Lat. *ars*. This seems to be particularly the case with the subsequent restriction of Germ. *Kunst* to the specialized reference that is symbolized in English by *art*.[14]

Sources of Semantic Change

Phonetic Coincidence.—It may seem paradoxical that although semantic and phonetic change follow each an autonomous course, many changes in meaning are due to modifications of the phonetic structure of the symbols. Thus, it is due to phonetic development that the first element of *by-law*,[15] which was originally a noun meaning 'town', has coincided in form with the preposition *by* and has acquired a good deal of its meaning; it at once is brought in connection with such words as *byname, bypath, byplay*, etc. It continually happens that the phonetic support of a reference disappears precisely because sounds change according to laws other than meanings. The result is naturally that if the latter are found worth preserving at all, they will have to be contextually linked with other symbols, and this is a genuine change of meaning so far as these symbols are concerned. Phonetic erosion of declensional and conjugational suffixes is connected with the use of many adverbs in the function of prepositions and of verbs in the function of auxiliaries with a concomitant paling of their meaning.

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[14] *Cf.* Albert Waag, *Bedeutungsentwicklung unseres Sprachschatzes*, 5th ed., p. 192; S. H. Kroesch, "Change of Meaning by Analogy," *Studies in Honour of H. Collitz* (1930), pp. 176–90; Kroesch, "Analogy as a Factor in Semantic Change," *Language*, Vol. II, pp. 35–46.

[15] O. N. *býr*, Sw. and Dan. *by* = 'dwelling', 'place', 'farm', 'village', 'town.' The word is preserved in many English place names, Grimsby, Rugby, Derby, Netherby, etc. See also page 282.

Syntactical Constructions; Ellipsis.—Syntactical constructions, often repeated, are likely to cause the crystallization of some special reference which a symbol owes to the situating effect of the constructional surroundings. A very striking instance is found in the referential change of Germ. *sehr* ('very'). Its primary meaning is 'painful', but because it was often used in superlative constructions, it eventually was bereft of its original meaning and became so generalized as to imply merely a qualitative degree. In this connection we may mention also the effect produced by ellipsis.[16] That Fr. *rien* (< Lat. *rem* = 'thing') means today 'nothing' is because the negative particle *ne* which frequently modified it could sometimes be omitted without jeopardizing clarity. In America *corn* has come to mean 'maize' because of the ellipsis of *Indian corn*. *Flour* is a shorthand term for *flower of meal*, *capital* for *capital city* or *capital property*, *meat* (= primarily 'food') for *flesh meat*, etc. Likewise, so-called pleonastic or redundant constructions may influence the referential habits in regard to a word. The German *ungefähr* primarily meant 'without bad intentions', 'without danger.' But because it often occurred in connection with constructions implying the lack of bad intentions anyway, the word *ungefähr* became a mere tautology, and its meaning was changed to the more general 'unintentionally', 'accidentally', 'approximately.'[17]

Cultural Changes.—Just as the reference is subject to shifts independently of what happens to the symbolizing sounds, it is very common that the referent changes in spite of an historically identical symbol. In other words, the phonetic aspect of a word or expression may preserve its historical identity and at the same time adapt its reference to the most thorough modifications of the referent. Thus the

[16] *Cf.* Wilhelm Franz, "Ellipse und Bedeutungswandel," *Englische Studien*, Bd. 62 (1927), pp. 25–35.
[17] *Cf.* Waag, *op. cit.*, p. 52.

English word *fee* is etymologically related to Lat. *pecus* ('cattle'). While the corresponding German *Vieh* has preserved this meaning, the English symbol has come to symbolize a reference to what has taken the place of cattle as a means of exchange, namely, 'money.' A *pen* was originally a 'feather', but when steel pens were substituted for feathers for the purpose of writing, the old word symbol was retained in spite of the changed referent. In Dutch a *gulden* was a 'gold' coin, although today nobody finds fault with such expressions as "silver" or "paper" guilders. This type of phenomenon is not confined to referents as material objects. On closer analytical observation many of our concepts are continually corrected, widened or narrowed, while the phonetic symbol remains relatively unchanged. Words like *mind, religion, virtue, morals*, etc., imply something different nowadays from what they suggested a century ago.

Lexical Borrowing.—Finally, when a word or expression is borrowed from a foreign tongue, its referential field is likely to be modified. This appears quite inevitable if we consider that the semantic clusters of two languages are never the same. In German *Delikatessen* symbolizes a reference to something else than its French model *délicatesse*. When an American hears the word *Frankfurter*, he thinks of sausages, while to the German the same word suggests the idea of the inhabitants of Frankfurt. Compare also the different meanings which the following French words have obtained in English environments: Engl. *bachelor* = Fr. *bachelier*, a graduate of a "Lycée"; Engl. *agreement* = Fr. *agrément*, 'liking, agreeableness, pleasure, charm'; Engl. *assist* = Fr. *assister*, 'to be present, to attend'; Engl. *bounty* = Fr. *bonté*, 'goodness'; Engl. *chair* = Fr. *chaire*, 'pulpit'; Engl. *defend* = Fr. *défendre*, 'to forbid, to defend'; Engl. *demand* = Fr. *demander*, 'to ask for', etc., etc.

Polysemy.—In the preceding paragraphs we have dealt with circumstances favoring the change of meaning from

without. There are, however, internal characteristics of this phenomenon which explain the easy influence exerted by such external circumstances. If we consider the polysemous character of standardized linguistic entities such as the word, the formula, the radical and nonradical parts, the systematic semantic value of features like word order, stress, or intonation, we can see at a glance that their meanings must be in constant flux. If all the significant units of the linguistic system were rigorously defined as to their referential capacity, a change could not take place unless the referents were found to have been modified and a corresponding new definition of the units concerned were made in the light of a conscious analysis. The terminology of science, as long as it is strictly confined to scientific usage, is not subject to semantic change except by revised definitions based upon findings as to the nature, structure, or qualities of the referents. For the chemist the signification complex of *metal* is exclusively and strictly determined by the nature, composition, and characteristics of the abstraction "metal." As long as this abstraction or the scientific knowledge of it remains unchanged, the symbol *metal* symbolizes some or all of a limited number of possible references to the same referent; in such circumstances its development to *mettle*, with the meaning of 'ardor' or 'keenness of temperament', 'courage', could never have come about. In science the reference connected with a symbol is compound only in so far as it represents a sum total of various specified references, which are strictly limited and fixed so that ambiguity is largely eliminated. In ordinary language, on the contrary, the compound reference of a systematized symbol never represents a "sum" of specified references, but a provisional and elastic complexity of contextual psychological realities and potentialities, a complexity which owes its existence and its structure to ever-changing speech experiences and which allows of infinitely varied adjustments and applications. In spite of its relative

standardization it is never complete, never finished, but always provisional, ready to serve the creative and constructive faculties of the human mind and thus to have its own physiognomy modified as a necessary consequence of this service. Every time a semanto-phonetic entity is used in speech, it is placed in a different environment of time, place, social constituents, of other semanto-phonetic units, of subjective mood, in short, in a different universe of discourse, and hence its reference is slightly or greatly modified.[18] A temporary, occasional modification this naturally is, but it may eventually contribute to a more lasting structural change.

Shift in Emphasis.—A systematized unit of language is polysemous to the point of being vague and ambiguous, a quality which opens the gates widely to a multitude of furtively modifying influences. In countless instances of semantic change we can witness the result of a shift of emphasis among the various actual or potential elements of a compound reference. Formerly the symbol *knave* symbolized a reference to 'boy', including among many other features those of 'servant' and 'rascal.' Then the emphasis was gradually laid upon the aspect 'servant', and the meaning of *knave* was changed accordingly. Still later the feature 'rascal' became psychologically prevalent, and *knave* assumed its modern meaning. Shift of emphasis there also is if the emotive implication of a word is gradually stressed at the expense of its referential value. Think of the gamut of sentiments aroused by such words as *bright, dark, prostitution, poverty, wealth, at last, graceful, pitiful, brag, lazy, springtime, sunshine, cemetery, rascal, Jew, romantic, home.* In addition to the technical restriction which the reference of the symbol *prohibition* has undergone in the

[18] *Cf.* pages 87*ff*. The divergence of the listener's interpretation from the speaker's intention is a frequent occasion of semantic change. *Cf.* Karl Jaberg, "Pejorative Bedeutungsentwicklung im Französischen," Teil 2, *Zeitschrift für romanische Philologie*, Bd. 27 (1903), p. 37.

United States and elsewhere, the word has become so charged with emotive value that it invariably suggests a certain attitude. In the same country *saloon* never symbolizes a pure reference to a thing; its meaning teems with political and moral sentiments of passionate aversion. It could be shown that the emphasis laid upon the emotive side of meanings is responsible for the semantic specification of an enormous number of words and word groups.

Tropes

The connection of all these phenomena with what is known as "figurative speech" cannot have escaped the reader's notice. For when we call a person a "chief" (< Lat. *caput* = 'head'), we emphasize one particular feature or function of the human head, namely, that it is the most important and central part of a complex organism, and we apply it to something else sharing this feature. Figures of speech are collectively called *tropes* (< Gr. *trópos* < *trépō* = 'to turn'), but according to their nature various special terms have been introduced with greater or less success. In a *metaphor* the transference is based upon the resemblance in some point or other of the referents referred to by the same symbol. Calling knowledge "a lamp" or a certain flower "a day's eye" (> *daisy*) is speaking metaphorically. Expressions like "The door squeaks," "Misfortune has killed him," "Vice is a monster" are likewise metaphors, but because we here ascribe the qualities or actions of a person to inanimate objects, we characterize such figures as *personifications*. If the semantic transferring is not due to a referential resemblance, but to some actual relationship such as contiguity in space or in time, causality, etc., the trope is termed a *metonymy*. Of this the *synecdoche* is only a special kind, inasmuch as it consists in the substitution of a whole by some of its parts or vice versa. When we invite somebody to drink a "glass", we use a metonymy, since the symbol referring

to the container is substituted for the one referring to the thing contained. But in the phrase "many head of cattle" or in the use of *roof* in the sense of 'house' we have examples of synecdoches. Then, there is the *hyperbole* or exaggeration, as when we say "I am terribly glad" or "I adore him"; there is the *litotes* or softening, as an expression of simulated modesty or for the sake of simplicity or emphasis. "She is not bad" means often enough "She is very nice," and when a contractor desirous to sell a newly built house tells you "This house is not a card house," he obviously wants to impress you with the solidity of his building. Needless to say, the litotes is closely allied to what we have described as "euphemism," and perhaps this circumstance explains why the former name has remained a technical book term while *euphemism* as well as *metaphor*, *hyperbole*, and their corresponding adjectives *euphemistic*, *metaphorical*, and *hyperbolic* have acquired a certain popularity.

Fossilized Tropes

The use of these figures of speech is so common and universal that language has been called "fossil poetry" or "a dictionary of faded metaphors." It matters not whether the process is a conscious one or not, the fact of its being found in language everywhere and at all times is quite undeniable. Many of the resulting changes in meaning are merely temporary and occasional creations of human fancy; others become so popular that they affect the referential field of the word in a more lasting way. Naturally, if that is what happens, the plasticity of the original figure is reduced and eventually lost by frequent usage. The vocabulary of every language is filled with worn off or fossilized tropes whose very existence is not realized by the community at large. A *seminary* is originally a seed plot; *nursery*, which comes from Lat. *nutrio* = 'to suckle, to nourish', has been borrowed by horticulture; *long* and *short* are used in connection with time

as well as with space to which they belong; *eliminate* is related to Lat. *limen* = 'threshold' and means 'to throw out of the house'; an *error* is a wandering, a straying. Instances of metonymy and synecdoche are found in *front*, which used to mean 'forehead'; *book*, which was a 'beech tree'; *quick*, which comes from the same root as Latin *vivus* = 'alive'; *fare*, which meant 'a journey'; *volume*, which was a 'roll', etc. Finally, that *astonish* was once hyperbolic and actually meant 'to thunderstrike' will surely seem astonishing to anyone not familiar with etymology.

Semantic Widening and Narrowing

From still another viewpoint it pays to compare the referential implications of a symbol as they were current at one time with those of the same symbol prevalent during a subsequent period. Sometimes we shall notice that a greater referential abstraction has taken place, with the result that the applicability of the symbol has increased or that the meaning has been generalized. The primary reference symbolized by *circumstance* < Lat. *circumstantia* = 'that which stands around' is, of course, considerably narrower than what the same symbol means today. In other cases the meaning is specialized, with a concomitant restriction of the applicability of the symbol. A *fowl*, which once referred to a bird in general (compare Germ. and Du. *Vogel*), is now confined to a bird of the poultry kind. Furthermore, a symbol may be found to have acquired a nobler, more elevated meaning than it used to have. A *boudoir*, whose etymology suggests a 'sulking room', has come to mean 'a lady's private room.' But the reverse, or a semantic degeneration, is just as frequent in the history of language. In Old English the verb *to stink* could be used indiscriminately in connection with agreeable, neutral, or bad odors, and today the words *smell* and *odor* themselves have a decided tendency to refer to the less pleasant olfactory sensations. It seems as if the speak-

ing crowd, with the exception of the natural scientist, could not take an attitude of detachment toward odors; any symbol endowed with such pretentions is soon led into subjective channels and takes on an emotive hue.

Semantic Radiation and Concatenation

If the course followed by referential diversification be examined in a more formal way, including all or several of the meanings, partly overlapping, partly successive, of the same symbol, the development is likely to suggest one of two schematic pictures. In the first place, it may be such as to suggest the idea of a radiation of one central semantic aggregate in many directions. Each derived meaning is directly descended from the primary one, and its further vicissitudes may be quite independent of those of its sister derivations. The symbol *eye* symbolizes fundamentally a complex reference to the organ of sight. From this semantic core there radiate such derived meanings as 'power of seeing', 'sight', 'anything resembling an eye', as the hole of a needle, the loop of a hook, etc. Evidently, several radiation meanings, even relatively static ones, may originate and be current either simultaneously or successively. On the other hand, semantic development may assume the appearance of a sort of concatenation, the essential feature being a successive and progressive derivation of one meaning from another. The idea suggested here is that of a chain in which each link accounts for the following. This type of evolution is not compatible with a simultaneous origin, although a subsequent overlapping is perfectly possible. In the radiation process the connection of each derived meaning with the central one is felt very clearly, as their relationship is always one of the first degree. Semantic concatenation results in meanings whose kinship with the original may be in the xth degree and thus entirely hidden. There is no telling where a semantic complex developing in this way may end.

It is not uncommon that two contrary references turn out to be current at different periods in the history of the same symbol. The basic meaning of the Dutch *slecht* (= Germ. *schlecht*, Engl. *slight*) was 'smooth', 'plain.' Hence it was possible to speak of a "slechte zee" (= 'a smooth sea'), "slechte zeden" (= 'plain morals'), in the sense of 'a good sea' and 'good morals.' Nowadays the symbol means 'bad', and only a few fossilized formulas have preserved the original signification. Yet not many intermediate stages were required to bridge the apparent chasm between two such antithetical values. For what is smooth and plain is simple; what is simple is likely to be looked upon as not good enough; what is not good enough is rather bad.[19] If one analyzes the English word *pocket handkerchief* into its semantic constituents, it will be found to teem with contradictions. A *kerchief* is a thing to cover one's head with, while a *handkerchief* would imply that it is at the same time carried in one's hand, and *pocket handkerchief* assigns the local application of the object to three different sections of human topography. Nothing would be easier than to indulge in multiplying illustrations of this type, and surely those who like to oppose the logic of their mother tongue to the "erratic and inconsistent speech habits of foreigners" might derive some benefit from a greater abundance of English examples. But anyone realizing that the radiation and the concatenation processes continually mix and compound their products will not fail to see how complicated and at the same time how unlogical the semantic connections and developments of our words must be.

Besides, we have seen that meanings do not only change from within. In a great many cases semantic elements are added to the current meaning of a symbol from without. Semantic analogy, a change in the systematic clusters, bor-

[19] See also the change in the meaning of Fr. *rien*, page 308.

rowing, ellipsis, cultural and other external circumstances are instrumental in semantic transformations of which neither mere radiation nor mere concatenation can picture the course. It would be difficult to see how the meaning of our modern *flour* could have been derived from that of *flower* by a series of successive changes if it were not for the external influence of the ellipsis of 'flower of meal.'[20]

Semantic Change Other than Lexical

When dealing with semantic change it is customary to confine one's study to the history of word meanings, with a possible addition of more or less stereotyped expressions. But, of course, there is semantic change wherever there is meaning, so that all significant units share this dynamic drift with the word. For instance, in regard to the nonradical part it is interesting to note what happens to the Latin suffix *-arius* as represented by the French *-ier*. In *pomm-ier* it refers to the tree bearing or destined to bear apples; in *prisonn-ier* it designates the inmate of a prison while in *jeôl-ier* it means a guard of such an institution; in *caross-ier* it stands for the driver of a cart whereas in *voitur-ier* it refers to the maker of carts, etc. Similar changes could be shown to occur in the meanings of component parts. *Step-* (A.-S. *steōp-*) of *step-son* means 'bereaved', but how different its value becomes as soon as it enters into such other combinations as *step-father*, *step-mother*, etc. It is a very instructive experiment to try to describe the meanings of *-man* in *milkman*, *clergyman*, *fisherman*, *motorman*, *dustman*, *woman* (< *wifman*). That word order, stress, melody, etc., may acquire, change, or lose their semantic values can be gathered from our previous discussions. Finally, categorial modifications such as the loss of the dual, the semantic widening of plural and gender, the development of adverbial,

[20] *Cf.* Franz, "Ellipse und Bedeutungswandel," *loc. cit.*

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adjective, and other categories, the absorption of declensional cases by others (for example, of the instrumental by the ablative), the fact of a lexical category becoming syntactical or congruential, and many others could be shown to have occurred in various periods and quarters of the linguistic world.

CHAPTER IX

PRINCIPLES OF LANGUAGE CLASSIFICATION

Linguistic Boundaries

Language Differentiation

In order that language may serve its purpose as a means of social intercourse, it must be based upon a reciprocal agreement of several individuals as to the meaning of its symbols and devices. If he wishes to be understood, the individual is not at liberty to introduce arbitrary changes into his means of communication. A certa n rigidity, therefore, is essential to language. But this rigidity cannot be absolutely complete; a greater or less degree of flexibility and adaptability is just as necessary because of the enormous complexity and variability of individual and social life. It has been repeated *ad nauseam* that no two persons speak exactly alike and that the same person does not use the same language in different periods of his life and social shifting. It has been suggested also that within a larger community of people there are many secondary groups, all participating of the general life of the community but distinguishable by special needs. Countless differences will be observed from individual to individual and from group to group as to the production of sounds and their range of meanings, as to the vocabulary employed and the grouping of words into sentences, as to the particular molding of thoughts and feelings. As long as a social group remains essentially united by ties which make a mutual understanding of vital importance, the differences of speech must be subordinate to the necessity of general intelligibility within the group. But in proportion as those com-

mon bonds loosen on account of geographical, political, or other changes, in proportion as gradual or sudden barriers arise between parts of the group, the need that one section be understood by the other decreases. Each part thus separated will become in a greater or less degree independent of the other as regards their respective means of communication. Within each group taken by itself uniformity must prevail over individual differences, but between the two groups reciprocally uniformity may little by little disappear without any considerable social handicap. And when a certain degree of mutual unintelligibility has been reached between two such groups, there is no longer a question of one and the same language, but of two. What shows that a new language has arisen is the degree of impossibility of mutual understanding.

Degrees of Separation

At once the question arises: To what extent must the speech of one group of men be incomprehensible to another in order that their forms of speech be considered two languages? There are countless degrees of comprehensibility, just as in the process of disintegration of one social group into two or more there are innumerable transitional stages. When two or several groups have developed a number of linguistic peculiarities sufficient to give their systems of speech a characteristic stamp but insufficient to shatter the fundamental uniformity of the initial unit, we do not call their respective tongues different languages but varieties or perhaps dialects of the same language. If, neglecting a great many intermediate steps, we consider two extreme stages of separation far removed from one another in space or in time, there will be little hesitation in labeling them two different languages. This is particularly so if the idioms concerned cover a comparatively large area and are used for more than purely domestic purposes.

Standard Languages and Dialects

That there is no doubt about Dutch and German being quite distinct in spite of their contiguity is due to special circumstances. History shows that literary or national tongues are often the result of the influence of one dialect preponderating over others so that the latter are gradually overruled by the former. One dialect overlaps the others, which may or may not continue to exist in lower channels. One is used for intellectual, political, literary, higher purposes by all the members of the primary group, the others are either absorbed by it or else confined to domestic or, in any case, more limited uses by secondary groups. Both in the Netherlands and in Germany there are numerous dialects flowing into each other, but in each of these countries there is only one standard language. In the Netherlands the West Low Franconian dialect of the province of Holland was in due time raised to the level of a literary language and adopted by all Dutchmen in their common national life. In Germany the standard language is the result of a compromise between Middle and High German dialects of Upper Saxony; it overlaps the numerous dialects in the various parts of the country. Now, between The Hague and Saxony there is a long way, and at the time when their respective dialects developed into standard languages, some sixteen centuries of differentiation from their common Germanic source had elapsed. Their respective systems of speech are extreme exponents, originally separated by a great many intermediate stages of differentiation. The fact that they now are contiguous is rather accidental and does not cancel their original differentiating features. The line of demarcation between the national tongues of the Netherlands and Germany is, therefore, sharply drawn; there are no transitions. The same condition obtains in the case of other standard languages, as

French *vs.* Italian, etc. But only comparatively few standard languages have existed or are now existing. Even where we do find them, they do not always kill the other dialects. Leaving the national tongues of Holland and Germany out of consideration, it is practically impossible to point out where German stops and where Dutch begins. The boundary is not represented by a regular line but by a whole buffer region of the most whimsical delimitations where Dutch and German peculiarities are mixed.[1]

Number of Languages

If a count and classification had only to consider national languages with such a high degree of unification as the classical ones or our modern tongues, the difficulty would be rather small. But obviously such a procedure would be eminently unscientific. And so we have to face the impossible problem of drawing boundaries where we have only gradual differentiation. The difficulty is largely increased by the facts that many existing languages are not yet sufficiently known to admit of any scientific appraisal and that occasionally new ones are discovered. Moreover, how many languages have existed but disappeared in the course of time? It is, therefore, an elusive task to try to count the number of historical or even existing languages. Of course, it has been done more than once, but the results could not help showing enormous divergences. F. N. Finck in his little book *Die Sprachstämme des Erdkreises* sums up more than two thousand. Others discover any odd number.

Besides being elusive, the task of counting the number of languages is of no practical or scientific value. Much more important is the grouping of those that belong together for some reasons of similarity or relationship. But here again

[1] See, for example, L. Grootaers and G. G. Kloeke, Noord -en Zuid-Nederlandische dialectenbibliotheek, I. See also page 361 of this book.

the obstacles to be overcome are tremendous. Indeed, what will be the criterion of classification whose application would admit of no hesitation? Even if such a criterion could be found for now existing languages, our actual knowledge of a great many of them would be far from sufficient for any safe classification, not to mention such languages as have either completely disappeared or left only stray traces of a former existence. Hence, it can hardly be expected that the hope for a flawless classification of all languages will ever be fulfilled. Yet the attempts made are nevertheless interesting, not only in themselves but also inasmuch as they have stimulated linguistic research in all sorts of directions.

Morphological Classifications

Analysis in Language

In the first place, the structure of language was found an alluring and promising field of study. Although the classifications elaborated from this point of approach are today considered altogether inadequate, they have bequeathed us a number of very useful distinctions and a better insight into structural and morphological types. In order to make this clear, we must begin by insisting again that genetically the primary unit of speech is the sentence. In whatever function it is used, its meaning is felt to be a unit and is presented as such. Consequently, the sentence symbol might always consist of one sound or one sound combination semantically unanalyzable. In reality, this happens relatively often in emotive expressions and in so-called action words,[2] as when we exclaim "Great!", "Unique!", "Fine!", or when we order "Water!", "Think!", "Come!" It is also compatible with narrative speech: the mere symbol "Rain" may occasionally be used instead of "It rains." But it is quite evident

[2] *Cf.* page 100.

that if we had to use one irreducible linguistic symbol for each individual experience, language would become inarticulate and an awkward tool to handle, not to speak of the impossibility of inventing so many different symbols. Fortunately, in spite of its basic unity, every experience is at the same time complex. No language can escape the eventual necessity of decomposing the composite experience into some of its outstanding constituents. To the casual observer it may appear easy to decide which are the outstanding features that ought to be linguistically symbolized. If we want to refer to our visual sensation of a farmer ploughing a field, we believe it to be essential to isolate the referential components *farmer*, *plough*, and *field*. Yet, it would be conceivable that the component *field* were deemed entirely superfluous, or that the constituent *farmer* were felt to be replaceable by *man* or likewise altogether useless. The one symbol *plough* would explicitly symbolize the action, but implicitly also the agent (= the farmer) and the object of the action (= the field). Not only is this conceivable, but we behave very much in the way suggested when it comes to other occurrences. Our experience of seeing drops of water falling down from the sky upon the earth we refer to simply by saying "It rains." The referential components *drops*, *water*, *falling*, *sky*, *earth* we consider perfectly supererogatory from the point of view of linguistic symbolization. Others, however, might look upon some or all of these features as outstanding and in great need of formulation.

The question may rightly be asked whether there is a common minimum of analysis which would be essential to language in general and required by all languages in particular. Of course, a minimum there must be, otherwise there could be no symbolization. But it seems to us that all requirements arrived at by logical inference are nothing but postulates. It is thought that "since there must be something to talk about and that something must be said about

this subject of discourse once it is selected,"[3] every language must make some distinction between noun and verb. Although nobody will contest that logically we must distinguish between substance, action, state, property, etc., we do not see that any of these distinctions must necessarily be symbolized by a structural feature of language or even be explicitly traceable to a particular part of the symbol. The only thing that seems to be indispensable is that there be symbolized a referential minimum, and that in empirical speech contexts that which is not explicitly referred to by means of a semanto-phonetic part of the symbol be at least implicitly suggested and inferable.

An entirely different situation obtains in the case of any particular language or of any individual speaker. Here the minimum of analysis can be determined from an examination of the experience or referent concerned, in conjunction with the intention of the speaker and the specific customs or patterns of symbolization and reference recognized by the language. But that minimum will be different from language to language. It hardly needs mentioning that under no circumstances is it possible for a language to carry its analysis so far as to symbolize all the constituents into which an experience could be decomposed. This is tantamount to saying that however thorough the analysis, the linguistic symbol must always be to a large extent suggestive. Only one or a few referential parts are positively symbolized; all the others are implicit, and it is the individual's task to infer as much of them as his imagination and the circumstances will allow and require. It is also worth noting that the same language proceeds to an elaborate analysis in one instance while elsewhere it contents itself with a more sober or completely unanalyzable symbol. Compare the English *twelve* or *dozen*, both indivisible symbols, with *fourteen*, *twenty-three*, *one hundred and*

[3] *Cf.* Edward Sapir, *Language; an Introduction to the Study of Speech* p. 126.

sixty-nine, etc. We have already shown how the Germans analyze linguistically the reference of the English symbol *skate*.[4] Another illuminating comparison can be made between the Dutch symbol "Het knaapje fietst" and the corresponding English "The little boy rides a bicycle" or the French "Le petit garçon va en bicyclette."

Synthesis in Language

If analysis is entirely indispensable for a flexible linguistic symbolization, it is, of course, not enough. The mere decomposing of an experience into such components as *farmer, plough, field* would destroy its unity. The combinations "plough–field–farmer," "farmer–field–plough," or "field–farmer–plough" would mean nothing in the way of a linguistic reference to what we have seen. Somehow the separate partial references have to be correlated to form a unit corresponding to that of our experience. So far as English is concerned, we must indicate that the farmer is the acting subject and the field the object acted upon, that the ploughing is taking place at a certain time, that the farmer and the field are the ones referred to by a previous mention or by other circumstances. These conditions are fulfilled by saying "The farmer ploughs the field." Subject and object are here indicated by their respective positions in the sentence, the category of tense is symbolized by the form of the verb, the farmer and the field are set off as known by the use of the definite article. We have thus brought out by linguistic synthesis the original unity of our experience despite its previous analysis. In this general sense it is beyond doubt that every language must be both analytic and synthetic. But the greatest variety may prevail as to the nature of the analytic and synthetic elements, as to their relative number, as to their manner of combination and correlation. And it is

[4] *Cf.* pages 143*f.*

here that some of the current classifying distinctions are made.

Autonomous and Binding Elements; Verb and Noun Languages

Whatever the analyzed components are in other respects, some or at least one of them must be presented as independent, autonomous, central, others as relational, binding, leading to the unification of the sentence. To return to the farmer's ploughing, we have decomposed the experience into the three autonomous constituents *farmer, plough, field,* which play the parts of columns in the structure of the sentence. The other components, symbolizing subjectivity, objectivity, tense, mode, etc., are binders. The autonomous parts may also be pictured as centroids around which the binding components radiate in various directions. Among the three centroids of the above sentence we can further distinguish the radical of the verb *plough-* as more important and as the pivot about which the whole sentence unit moves. Languages in which the verb constitutes the pivotal part of the sentence are known as *verb languages.* It is the type of structure with which we are so familiar because it is that of our own tongue. In the *noun languages,* on the other hand, the pivot of the sentence is a noun or a nominal radical, and that which we are wont to symbolize as secondary subject and object centroids is here found in attributive or adjectival functions. In Greenlandic, for example, the sentence "I hear him" is "TusaRp-a-Ra," which would literally mean 'sounding-his-my'.[5] In English the hearing is referred to as an action emanating from the subject and extending to the object, in Greenlandic as a state or thing which belongs to "him" as an emanation and to "me" as a sensation. "I see it" would be in Greenlandic "appearing-its-my" (= 'it

[5] *Cf.* F. W. Finck, *Die Haupttypen des Sprachbaus,* pp. 31*f.*, 159.

appears to me'), "I kill him" = "dying–his–my" (= 'he dies away from me'), "I throw it away" = "flying–its–my" (= 'it flies away from me'), etc. If we emphasize the relationship of the referential parts to one another, it is noted that the Greenlandic sentence consists of a noun and its attributes, whereas the English one is formed by a subject and its predicate. Hence the further division into *attributive* or *possessive languages* and *predicative* ones.

Formless and Form Languages

The distinctions hitherto made lay all the weight upon the structural features of the sentence. But analysis as well as synthesis can be found at different levels in linguistic symbolization. In place of considering the structure of the sentence as a whole, we may concentrate our attention upon the various centroids and other semanto-phonetic parts into which a sentence is analyzable. It is chiefly the study of these that has bestowed upon us a number of morphological criteria, important in themselves and utilized by many as valuable principles of classification. To begin with, a contrast was pointed out between so-called *formless* and *form languages.* It was based upon the erroneous assumption that there was form in language only if the syntactical relations between the autonomous sentence elements, which were considered as representing the material part, were symbolized by means of purely formative, that is, nonradical, symbols. Seen from this angle, of course, Chinese would be a formless language since it ignores derivation as a method of word formation. But such a narrow definition of form can no longer be adhered to, now that the structure of language is better understood. Just as there must be both analysis and synthesis in every working system of speech, there must also be matter and form. But the latter need not be so conspicuous as to be traceable to formative elements; it may be found in independent words acting as occasional or system-

atic binders, in word order, stress, intonation, quantity. For, although not so palpable, these formal mediums are none the less of a most effective symbolizing power. Sometimes they are referred to as endowing language with *inner form* instead of the *outer form* given it by the presence of derivational structure, a distinction which is, however, purely superficial.

Analytic and Synthetic Languages

After what has been said about analysis and synthesis, it might seem that a classification of languages into *analytic* and *synthetic* ones must be entirely unfounded. Yet there is something really valuable at the basis of this terminology, provided that we take care to make it describe only the structural features of the analyzed components, not those of the sentence as a whole. The constituents of the sentence may be represented as unanalyzable words, as compounds, formulas, radicals, affixes, constructional groups, by way of radical modification, of word order, quantity, pitch, or stress. Now, some languages proceed to a certain amount of synthesis in a systematic way, independently of and previous to any immediate sentence or speech formation. In other words, their finished system words are the products of a preliminary synthesis. The structure of compounds, however, is deliberately disregarded in this connection, so that only the derivational word is taken into account. It is evident, then, that such languages as do not isolate their words as unanalyzable entities but treat them as consisting of a radical and a number of derivational parts present a more synthetic character than those whose words are morphologically simple.[6] It matters not whether the nonradical elements serve a functional, syntactical purpose or a purely lexical one. In the Latin sentence "Amicus fratris mei amat

[6] See also our section on "The Word and the Sentence," in Chapter iii.

libros" ('my brother's friend likes books') every word is felt to consist of a radical and one or more derivational parts. The ending of *amicus* shows that it is the subject of the sentence and that it is singular; *fratris* indicates by its ending that it modifies another noun in a particular way and that it is singular; *mei* shows formally that it modifies a masculine noun which is itself a modification of another noun; *amat* can have a subject only in the third person singular, its form symbolizes the relation of the radical meaning to time and its modality according to the speaker's mind (that is, the "loving" is referred to as actual, not as merely possible); in virtue of its ending *libros* is in the function of a direct object and in the plural. All the incremental references symbolized here are somehow syntactical. But words like the Latin *expello* ('I expel'), *amabilis* ('lovable'); German *wörtlich* ('literal'), *Häuschen* ('little house'); French *garçonnet* ('little boy'), *incroyable* ('unbelievable'); English *farmer, greatly*, etc., are, at least in part, lexically synthetical. There are naturally many degrees of analysis and synthesis of this type, and the same language may very well be analytical in one respect and synthetical in another. Those which do not synthesize at all in this sense, like Chinese, or do so only moderately, like English, are analytic languages, while Latin and Greek are rather synthetic. Standard German is more synthetic than German dialects, etc. The process of synthesis may go very far, and if it is syntactical, it may reach the point where the sentence coincides extensively with the word. If the sentence is a simple one, comprising only a few referential components, many languages occasionally attain to that degree of synthetic perfection. Thus, Lat. *edo* ('I eat') symbolizes the radical reference as well as the referential increments of subjectivity, tense, modality, and number, and the one word may function as a sentence. But there are languages in which complex sentences are decomposable into only very few finished words or in which even a

single word symbol is made to function as a complicated sentence. A good many, though not all, of the American native idioms are of this type, which goes by the name of *polysynthetic*. For Greenlandic, Finck gives the following illustration. *AulisaRpok* = 'he fishes'; the suffix *-ut* means 'instrument', and so *aulisa-ut* = 'fishing–instrument' = 'fish line.' The Greenlander proceeds adding one suffix after another, thus : *aulisa-ut-isak* = 'fishing–instrument–suitable (thing)' = 'that which is suited for a fish line'; *aulisa-ut-isaR-siwu-nga* = 'fishing–instrument–suitable(thing)–obtaining–my' = 'I procure (obtain) for myself something suitable for a fish line'; *aulisa-ut-isaR-si-niaRpu-nga* = 'fishing–in-instrument–suitable(thing)–obtaining–trying–my' = 'I try to procure for myself something suited for a fish line'.[7] The peculiar thing, of course, is that this whole sentence consists of only one word in the linguistic consciousness of the Greenlander; none of the added affixes is capable of being used autonomously in his language, any more than the English suffix *-ly* is ever found outside of derivational words like *lovely*, *lively*, etc.

Agglutination

The manner in which the radical and nonradical elements are joined to form a finished word supplies us with a further criterion of morphological distinction. In words such as *love-ly*, *great-ness*, *for-give* the two parts are loosely juxtaposed or glued together, so that they can easily be separated without either of them undergoing a noticeable phonetic change. The same affix may thus be added to a great many other words or radicals of a certain semantic or categorial type. This process, known as *agglutination*, is not unfrequently resorted to in English; in a considerable number of languages it is very widely, if not exclusively, used in

[7] *Cf.* Finck, *op. cit.*, p. 32.

the making of derivational words. Those of the Turkic, the Finno-Ugric, the Bantu, the Malay-Polynesian groups are largely agglutinative. A number of them present the interesting phenomenon of vocalic harmony,[8] which clearly stresses the subordination of the affix to the radical. In Turkish the element *-m . . . k* symbolizes the infinitive modality of verbs, the vocalic part being made to agree with the vowel of the radical: thus *sev-mek* = 'to love', *yaz-mak* = 'to write.' By adding the reciprocal suffix *-is* we get *sev-is-mek* = 'to love each other'; *sev-dir-mek* is synonymous with 'to cause to love', the suffix *-dir* being a causative one; hence, *sev-is-dir-mek* = 'to make them love each other'; and with the addition of the passive suffix *-il* we obtain *sev-il-mek* = 'to be loved' and *sev-is-dir-il-mek* = 'to be made to love each other.'[9] Agglutination is the more genuine the more widely and exclusively one affix is utilizable for the same referential increment in a particular line of words. In the English plural *ox-en* the suffix is more intimately (that is, less agglutinatively) joined with the radical element, it belongs more specifically to it, than is the case with the plural ending of *pen-s*, because the word *ox* holds almost the monopoly for the use of *-en* as a plural suffix.

Fusion

A circumstance which also expresses the agglutinative degree is the phonetic stability or instability of the combining parts. Formations like *dictátor* and *dictatórial* may still be considered as essentially agglutinative, but the accentual shifts which accompany the process of suffixation result in a decidedly closer unification of the words. When the union of radical and nonradical parts is so great that a considerable alteration of either or both occurs, we obtain another struc-

[8] *Cf.* pages 150, 232.
[9] *Cf.* Finck, *op. cit.*, pp. 74*f.*; Karl Wied, *Leichtfassliche Anleitung zur Erlernung der türkischen Sprache*, pp. 29*ff.*

tural type altogether, namely, the *fusional* one. While doubt as to the nature of the process might still be cherished in regard to the derivation of *impossible* from *in-* + *possible*, there is a clear case of fusion in *depth* from *deep* + *-th*, in *fret* from *for-* + *eat*, in *height* from *high* + *-th*. Yet not even these are such perfect specimens of fusion as occur when the incremental reference is symbolized by a mere change of the radical. In the English forms *sing*, *sang*, *sung* or *mouse*, *mice* the fusion is so complete that not a shadow of affixation is left. We have seen that in the Semitic languages such a high degree of fusion is extremely common. The consonantal elements of the word constitute the root with its implications of the radical meaning. As such it has only a fictitious existence; its formal individuality is not obtained until a set of at least two vowels has been inserted, symbolizing some referential increment. Normally, agglutination implies that to each affix corresponds one type of referential increment, while fusion is likely to result in a semantic condensation at the same time. A French form like *acquîmes* from *acquérir* ('to acquire') symbolizes, aside from its radical reference, the semantic increments of tense, mode, number, person, and it is impossible to trace each of them to a separate morphological element of the word.

Inflection

Agglutination is sometimes contrasted with what is known as *inflection*, as if the latter term were synonymous with fusion. The term inflection, however, was mainly suggested by the structural peculiarities of the older forms of Indo-European, where fusion is resorted to not only as a method of lexical derivation, but also of syntactical symbolization. The incremental references symbolized by the Latin *scripsissem* ('I should have written') or by the declensional forms *pater*, *patr-is*, *patr-em*, etc., are almost exclusively of a syntactical nature, because they point to various relationships

of the words to the sentence or parts of the sentence. In the English *depth* we have fusion with a purely lexical significance, and therefore it cannot be said to illustrate the flectional type. In so-called inflective languages both the fusional process and the derivational method of syntactical symbolization are combined.

Isolation; Monosyllabism

Another distinction is that which is sometimes made between affixation in general, whether agglutinative or inflective, and *isolation*. Languages whose finished words are never or seldom derivational, for instance, Chinese, are therefore called *isolating*. If, in addition, the words generally consist of only one syllable, the language is referred to as *monosyllabic*. Again, Chinese is the ideal representative of monosyllabism, although genuine compounds occur in great plenty.

Incorporation

Finally, we must mention a morphological type which is sometimes confused with polysynthesism, namely, *incorporation*. As the name indicates, it consists in incorporating certain derivational parts into the body of what may otherwise act as a finished word. In this sense infixation is a good example of incorporation. Still, it is not necessary that the insertion penetrate into the very core of the radical; it may slip in between two semanto-phonetic parts, that is, between radical and affix, or between two affixes. The Turkish infinitive *sev-mek* ('to love') is subjected to the incorporating process in *sev-is-mek* ('to love each other'), *sev-is-dir-mek* ('to make them love each other'). A more specific kind of incorporation is that which is combined with fusion or inflection, and which is sometimes a necessary condition for a word to exist. In Nahuatl, a Mexican Indian language, the word *ni-naca-qua* corresponds to 'I–meat–eat' = 'I eat meat', in

which the object *meat* is incorporated. With transitive verbs this incorporation of an object is absolutely essential to the emergence of a finished word, so that "I eat" can only be rendered by *ni-tla-qua* = 'I–something–eat' = 'I eat something.' An object noun may escape incorporation, but then a pronoun takes its place in the body of the verb, as in *ni-c-qua in nacatl* = 'I–it–eat the meat' = 'I eat the meat.' Words subject to being incorporated have a shorter form when inserted, a longer one when used autonomously. Thus *naca* ('meat') is the abbreviation of the independent word *nacatl.*[10]

The Word in Isolating and Nonisolating Languages

Comparing the finished words of an isolating language with those of an affixing or fusional one in which syntactical relations are symbolized derivationally, we may note a few interesting characteristics of the two types. Chinese words, for instance, are formally complete and supreme in their isolation; they call for nothing beside them, at least not in virtue of their form as system words. The Chinese sentence is more in the speaker's and listener's minds than in phonetic symbolization. The orientation of the word toward the higher sentence unit is obtained psychologically rather than phonetically. Phonetically and morphologically the word is a closed and impenetrable unit, its individuality is incapable of any further elaboration or decomposition; but psychologically it has considerably less individuality, since it calls for a great many specifications as to its category, function, etc. In languages of this kind the synthesis of the sentence may result from the use of independent words of relation, from intonation, from word order. Morphological devices such as

[10] *Cf.* H. G. C. von der Gabelentz, *Die Sprachwissenschaft,*[2] pp. 354*f.* See also Sapir, "The Problem of Noun Incorporation in American Languages," *American Anthropologist,* N. S., Vol. XIII (1911), pp. 250–82; also A. L. Kroeber, "Incorporation as a Linguistic Process," *ibid.,* pp. 577–85.

declension and conjugation are lacking, but syntax is extremely important. In Chinese *wo*^{3}*ta*^{3}*ni*^{3} = 'I beat you', *ni*^{3}*ta*^{3}*wo*^{3} = 'you beat me'; *ts'ai*^{2}*jen*^{2} = '(the, an) able man', *jen*^{2}*ts'ai*^{2} = 'the ability of the man'; *hao*^{3}*jen*^{2} = '(the, a) good man', *jen*^{2}*hao*^{3} = 'the goodness of the man' or 'the man is good.' On the contrary, a Latin word like *fratris*, by virtue of its very form, calls for a companion; it is formally headed for the higher unit of the sentence; it contains a hyphen which demands the other term. Psychologically it is more individualized by referential specifications as to category, function, gender, number. In Latin, therefore, word order as well as the use of auxiliary words of relation are of less importance. Sentences like "Fratris mei amicus libros amat," "Libros mei amicus fratris amat," "Amat mei fratris amicus libros" have undoubtedly different stylistic and, perhaps, emotional values, but they are all correct and unambiguous.

Criticism of Morphological Classifications

The information as to typical structure and morphology derived from the study of individual languages along the lines indicated in the above paragraphs is certainly most enlightening, but it must be admitted that the distinctions made have been greatly abused by those in quest of an acceptable classification of languages. Especially, the once popular tripartition into "isolating," "agglutinative," and "flectional" languages has been definitely abandoned by linguists. The three terms refer to conditions found at different levels in language. "Isolating" contrasts with affixing in general, not only with agglutination or flection; "agglutinative" contrasts with fusion, regardless of its function; "flectional" stands by itself, as it combines fusion and syntactical symbolization. Besides, a linguistic classification based upon this threefold structural division mixes hopelessly the structure of the sentence and the morphology

of the finished system word, a procedure which must result in all sorts of misrepresentation and misunderstanding. If we consider further that any kind of linguistic structure is realized rather as a tendency than as a permanent condition, we must be very sceptical about all grouping of languages on a structural basis. Any particular language may possess more than one type of structure at the same time; morphological synthesis and analysis, flection, agglutination, isolation, prefixing, suffixing, incorporation, etc., they all or several of them may be operative in the same idiom. It is quite true that not seldom a language emphasizes and generalizes one tendency to the detriment of the others, but such emphasis can hardly ever be said to be exclusive. Even in Chinese, isolation and analysis can be claimed to be carried out consistently only on condition that the process of composition is deliberately disregarded.[11] Nor can any language lay a permanent claim to a certain structural or morphological type. In the course of history a tendency moving the language one way may be gradually shifted and displaced by a drift of a completely opposite character. Although the definition of our distinctions may be so closely circumscribed that we are justified in calling them stable, immutable values, the idiosyncratic qualities of a language that cause it to be considered as isolating, synthetic, flectional, etc., are essentially relative and changing factors. Classifications based upon such qualities, therefore, are rather of a kinetic character; the headings always remain the same while the languages classified will not only overlap several rubrics, but gradually move from one to another. And finally, that

[11] Besides, Chinese seems to have been flexional before becoming isolating. *Cf.* page 418; *cf.* also Bernhard Karlgren, "Le protochinois, langue flexionelle," *Journal asiatique*, Tome 15 (1920), pp. 205–32. Even modern Chinese operates with a small number of suffixes, and its monosyllabism resulting in an enormous number of homophones seems to encourage a gradually growing tendency toward a new derivational type. See Karlgren, *Sound and Symbol in Chinese*, pp. 33, 34.

a tendency toward a particular type of structure is often generalized by a speech community is largely due to the action of conditions and forces of such a universally human character that we are bound to meet with any number of fortuitous coincidences in the most distant parts of the world. Hence a structural classification will inevitably result in throwing together languages between which there exists no connection whatsoever.

Ethnological Classification

The Theory of Ethnographic Relationship

In the latter part of the last century Friedrich Müller[12] published a treatise on general linguistics in which he advanced the theory of a close connection between peoples and languages. He believed that there were about a dozen original racial types but that speech was not acquired by them until they had developed some hundred different ethnical groups, each with a certain social coherence. Hence he assumed the existence of about a hundred linguistic types, which in turn had evolved a large number of particular languages, because each ethnographic group was in due time exposed to all sorts of causes of diversification. The languages of the same group are thus interrelated, but no relationship is admitted between the idioms of one group and those of another, since the various linguistic types possessed such idiosyncratic characteristics as to allow of no intercrossing. Müller attached special importance to the form of the hair (curly, straight, etc.). His theory, however, was never taken very seriously by linguists, and if it were not for various prejudices and distorted notions lingering in many quarters in regard to language and its relation to ethnic characteristics, it would not pay to dwell upon it.

[12] Friedrich Müller, *Grundriss der Sprachwissenschaft* (Vienna, 1878–88); *cf.* also pages 353*f.*

Criticism of Ethnological Classification

In the first place, it was a mistake to take a polygenetic origin of the human race for granted, since it is quite impossible to arrive at any safe conclusion as to the origin of mankind. Historical evidence is utterly lacking, and anthropologists have to bridge over many yawning gaps with hypothetical constructions to reach down to the beginnings of humanity. If human races have evolved into existence independently of each other on various parts of the globe, it is quite natural to assume that they have developed a certain number of different types of speech. But even then their subsequent intermingling could result in the emergence of new linguistic types whose origin could not be traced because of lacking evidence. From what we know about the nature and history of language, a linguistic pattern is not an hermetically closed, impermeable system, eternally and immutably the same. Modern English is a continuation of Primitive Indo-European, but only after making allowance for all kinds of very important qualifications is it permissible to consider the two as representatives of the same linguistic type.

As for the racial characterization itself, whatever criterion we may choose, we nowhere find it realized with such a degree of purity as to result in a physically homogeneous population. A Japanese who from his earliest childhood is reared in Great Britain, using the English language as the exclusive vehicle of education, will have English for his mother tongue. He will use the same linguistic type and with the same facility, he will experience very much the same difficulties in learning the Japanese language, as a genuine Englishman.[13] A mere

[13] J. J. A. van Ginneken mentions the following case: "Ich dachte an einen mir von Dr. Adriani mitgeteilten und hiermit vollkommen übereinstimmenden Fall eines Troadjakindes, das bereits im ersten Lebensmonat nach Flores hinübergeführt wurde und das dort ohne einen Troadja in seiner Nähe wohl die Wörter der Floressprache

glance at the motley population of the United States shows how little can be said for racial and linguistic interdependence. Germans, Dutchmen, Frenchmen, Italians, Scandinavians, Poles, Russians, Japanese, negroes, all have substituted English for their original forms of speech, and we know how few generations are required to effect a thorough linguistic assimilation. Nor do the English of England supply us with a much better illustration of ethnical homogeneity. The Anglo-Saxon dialects were imported to the British Isles by the Low German Angles, Saxons, and Jutes of continental Europe. It does not seem likely that the invaders should have driven all the original Britons from their homes into the mountains of Wales or wherever else Celtic dialects are perpetuated. On the contrary, victors and vanquished eventually mixed with each other, the Britons taking over the language of the Anglo-Saxons. Later, at the time of the Norman conquest, a new mixture of the indigenous inhabitants with the conquerors took place, to which the vocabulary and structural features of the English language testify. The Normans themselves were a mixture of Scandinavians and Frenchmen, who, in turn, were an amalgam of pre-Celtic, Celtic, Germanic, and Roman elements. But the Romans gave their language to the heterogeneous population of France, and the Scandinavians in Normandy exchanged theirs for that of the autochthonous people of Normandy. It is easy to see that racial intercrossing cannot be thought of as parallel to changes of linguistic types. Although racial mixture leaves undoubtedly its imprint upon the language of the mixing people, ethnographic characteristics must be discarded as a possible criterion in the classifying of languages.

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sprechen lernte, aber mit starkem Troadjaakzent und -Artikulationsbasis." (*Indogermanische Forschungen*, Bd. XLV (1927), p. 8.) But even if we accept this case as correctly interpreted, it is certainly an exceptional one.

Genealogical Classification

Its Basis in Linguistic History

By many, genealogical classification is considered the most promising procedure, because it is based upon more scientific foundations and depends not upon changeable structure but upon historical facts of linguistic development. It would be more exact to call it the historical classification, as there is no such thing as a genealogy of languages in the true sense of the word. A genealogy implies the bringing forth of one being by another by a process of duplication, after which the two beings, the generating and the generated, exist autonomously and simultaneously. When we speak of a "family" of languages, of "sister," "daughter," or "related" languages, we only use metaphorical expressions.[14] One language does not bring forth another; man is the only maker of language, which is a human activity of an essentially social character. It is the result of an ever-renewed producing on the part of the human mind, partly along purely creative, but chiefly along combining and constructing lines according to inherited patterns. Separated from the human mind, these patterns are dead and sterile; whatever life they have they owe to man, who uses them not as rigid tools, but as flexible molds capable of continuous adaptation and variation. His mental combining, constructing, and creating gradually reshapes the patterns themselves, so gradually that, unless extraneous forces interfere, there occurs no break of continuity. The speaking community always remains aware of handling the same medium, although the uninterrupted process of scarcely noticeable modification will inevitably lead to something quite different from what it was at the beginning. In a sense, Modern French, as well as the other Romance languages, are Vulgar Latin transformed in

[14] *Cf.* Franz Scholle, *Ueber den Begriff "Tochtersprache."*

the course of the ages, just as the octogenarian is the same man as the one he was at the age of ten, but transformed by age and all that it implies. But from another point of view Modern French, Spanish, Italian, etc., are new languages, since the differentiations have accumulated to such an extent that the modern Romance communities are utterly unable to understand either Vulgar Latin or the languages of each other. The generating causes of language diversification are not inherent to language itself, but to the speakers and the special circumstances of their history. The relationship between the various Romance languages fundamentally consists in the historical fact that they once were the same language. We may call them "akin" to each other, or "sister" languages descending from the same ancestor, provided that in so doing we are aware of using a purely metaphorical terminology.

The Historical Method

To establish such a relationship between two given languages it would not be necessary to resort to a comparative examination of their phonetic, morphological, or syntactical features if we could trace back the history of each to the common point from which they started. Indeed, such would be the straightest and safest method to establish a fact which is above all historical. The relationship of Spanish, Italian, and French, for instance, can be established with a fair degree of adequacy without resorting to a mutual comparison of these languages. We can follow their history independently of each other in three uninterrupted chains of written records to a period where each is unmistakably recognizable as a modified form of Latin. No matter how different they are today or will be in the future, as long as the people of Spain, Italy, and France intend to use the traditional speech of their forefathers, their languages will be historically or genealogically related. According to this

principle of classification, similarities of structure, phonetics, vocabulary, or syntax are the result of relationship, not its cause. After many centuries of cumulative changes a language may evolve entirely different linguistic patterns, so that in the end all actual similarities have disappeared and nothing could be inferred from a comparison of patterns. If Bulgarian and English were known to us only in their modern forms and if we had to approach them without what we know otherwise about the characteristics of Indo-European, it would be practically impossible to establish their Indo-European relationship. It matters not how widely two given idioms differ, they may nevertheless have a common origin.

The Comparative Method

Unfortunately, a long series of written documents such as exhibit the development of the Romance languages is extant only in comparatively few instances. In the case of ideographic writing even such documents would be of little avail. For if the writing system is not based upon a phonetic analysis into sounds, if the written symbols are such that in spite of their relative identity their phonetic values may vary according to time and place, it is indeed very difficult to trace the history of sounds and forms. It is partly for this reason that we know comparatively little about the development of Chinese in spite of its very ancient literature on record. Because of many documentary deficiencies the comparison of languages becomes a practically indispensable auxiliary in the establishing of historical relationships. Although a long evolution may gradually eliminate former similarities, it is likely that two idioms which are mere modifications of originally the same language will for a long time preserve a number of common features. And these will be the more evident and indicative the less the languages in question are separated in time, space, and swiftness of transformation from their common point of departure. But

again, the possible action of all sorts of extraneous factors, particularly of linguistic mixture, may complicate matters tremendously and must always be kept in mind if misinterpretations are to be avoided.

If there exist written documents of some antiquity, especially if they make use of an alphabetic system of writing, a combination of the historical and comparative methods will usually lead to safe conclusions, even though in their present forms the languages under consideration are to all appearances quite unrelated. From a comparison of the Modern French words *chef*, *larme*, *cent*, *épier*, *dix*, *suivre* with the Modern German words *Haupt*, *Zähre*, *hundert*, *spähen*, *zehn*, *sehen*, it would hardly be allowable to assert that they are historically related; but if their history records forms like O.H.G. *houbit*, O.H.G. *zahar*, O.H.G. *hunt*, O.H.G. *spëhōn*, Goth. *saíhwan*, O.H.G. *sëhan*, O.H.G. *zëhan*, on the German side, and Lat. *caput*, Lat. *lacrima* < Old Lat. *dacruma*, Lat. *centum*, Lat. *specio*, Lat. *decem*, Lat. *sequor*, on the French-Latin side, it is evident at once not only that they are not so different, but that French-Latin *c* (= *k*) regularly corresponds to German *h*. The common origin of these words becomes still more conspicuous if in regard to several other sounds of theirs such regular parallelisms can be pointed out. Consistent phonetic correspondences naturally suggest the action of linguistic laws which have caused a differentiation of initially identical or at least very similar forms. Where no records exist at all, as is the case with most American Indian idioms, no other method is available than a comparison of their present features. Under these circumstances it is very difficult to establish the degree or even the fact of their relationship. Although actually they are perhaps modifications of the same initial linguistic unit, their present forms may be the result of secular transformations which have obliterated every apparent sign of parallelism and genealogical kinship.

Criteria of Genealogical Relationship

Geographical Location.—The question as to which particular features constitute the surest criteria of genealogical relationship has been differently answered by different linguists. Some attach much importance to the mere external fact of geographical location.[15] Two languages which are geographically separated and at the same time share a great many words are thought to be probably related, especially if they cannot be shown to have had any close contact in historical times. Indeed, if the presence of many common words is not due to borrowing, it must be explained by a common ancestry. Unluckily, of the history of peoples whose languages are not recorded we usually know so little that it is impossible to prove absence of contact on the part of the different tribes for any considerable period of the past. Hence the test becomes very unreliable, since in the course of history we witness most thorough disturbances of the initial geography of many languages on the map of the world. Whole communities migrate to distant countries, carrying their language with them (*cf.* South African Dutch); or conditions favor one idiom at the expense of others so that the latter become entirely extinct and the conquering idiom finds itself contiguous to strange neighbors (*cf.* the Greek *koinês*, several East Germanic dialects contemporaneous with Gothic, etc.); or, again, the weaker dialects find a comparatively quiet shelter in mountainous regions or along the seashore, thus forming linguistic islands lacking all connection with the surroundings (*cf.* Basque, Hungarian, etc.).

General Structure.—Nor are similarities of general structure, phonetic, morphological, or syntactical, of any significance in

[15] *Cf.* A. L. Kroeber, "The Determination of Linguistic Relationship," *Anthropos*, Vol. VIII (1913), p. 389. It is quite obvious that in American Indian linguistics this criterion is of great importance, since hardly any written documents are available for comparison and analysis.

regard to genealogical relationship, however valuable for the science of language they may be on other counts. We have noted previously that the fact of two languages being subject to inflection, agglutination, isolation, to analogical formations, to the loss of endings under accentual influence, to assimilations, to the alteration of intervocalic consonants, etc., implies nothing from which to conclude that they are interrelated. Such similarities are the result of general trends which are always active, with greater or less efficiency, in all languages and which may very well produce the same effects independently and in very distant parts of the globe.

Vocabulary.—A certain common stock of words is, of course, to be expected in languages of the same origin. But more than ordinary care and enlightened skill are required in the tracing of the pedigree of a word. Words that prima facie point to identity of source may be absolute strangers. The Greek *theos* and the Latin *deus*, the German *Feuer* and the French *feu*, are not related, whereas French *venir* and *cinq* are cognate to English *come* and *five*. The greatest difficulty in the appraisal of a coinciding vocabulary is created by the fact that words travel from one language to another with extraordinary ease. No language has a purely autochthonous vocabulary; some borrow with unscrupulous parasitism. The reason is that words, in spite of their relative systematization, are somehow independent, loose entities in a language; any individual word can find its way into a foreign idiom without interfering with its characteristic grammatical system, without entailing a consistent change of connected phenomena. This is particularly true for languages whose words are not derivationally complex. We shall soon see how the introduction of exotic sounds or morphological structure would affect a language much more deeply. In many instances we are able to show approximately when and where a certain word was borrowed, but in the case of languages without preserved records this is quite impossible.

Even where records do exist, the origin of a large number of words remains unexplained or doubtful, because documents are seldom written with a view to supplying future generations with the necessary evidential material for lexical etymology. Unless we can establish a clear title for a word by historical evidence, the possibility always exists that at some period of the past it was borrowed from elsewhere. However great the similarity of word *a* in language *X* with word *b* in language *Y*, they may be borrowed from the same extraneous source, or *a* may come from language *Y*, or *b* from language *X*, or *a* may be taken from a language unrelated to *X* but related to *Y*, or their similarity may be the result of two independent developments from two different sources. In none of these cases does word resemblance throw any light upon the relationship of the two languages. From this it should not be inferred, however, that coincidence of vocabulary is of no diagnosing value at all. Words representing abstract or newly arising values are more liable to be loaned and borrowed than words of concrete or common contents. If a comparatively large number of words designating common objects like men, animals, parts of the body, stars, elements, or expressing common actions or states like eating, drinking, sleeping, or such words as personal pronouns, numerals, particles, etc., are found to agree in two or more languages, there are encouraging indications for relationship.

Phonetic Parallelism.—The greatest evidence is provided by phonetic and morphological parallelisms. This may seem strange at first sight, because, if anything at all, sounds are elements which are subject to continual transformations. The phonetic system of Primitive Indo-European is quite different from that of any of its later representatives; each language has a system of its own and contains some sounds which are absent in closely related idioms but which are found in much less related or absolutely strange ones. Among the Romance languages only French and Portuguese have devel-

oped nasal vowels, yet these are quite frequent in several South German dialects as well as in Indonesian and Iroquois. Italian agrees with English in that it has no rounded palatal vowels [y], [ϕ], [œ], while these are found in German, French, and several Indonesian idioms (for instance, in Dayak, Makassar). On the other hand, Spanish agrees with English in having the dental fricative [θ], whereas German lacks it. Armenian and Germanic share some astonishingly regular shifts of consonants.[16] From the fact that certain sounds are found to be characteristic of certain languages it does not follow at all that the languages are related. Although, strictly speaking, the possible number of phonemes is unlimited, yet those which have a pronounced individuality in any given language are comparatively few. And so it is inevitable that phonetic similarities should develop in many quarters of the world without any other causal nexus than that which arises from the common law of general linguistic change. As a matter of fact, only few of the Primitive Indo-European sounds are preserved in our language. English sounds like *o*, *p*, *k*, *b*, *t*, *d*, to be sure, also existed in Indo-European, but in English they all are the result of new developments from originally different phonemes. Indo-European *o*, *p*, *k*, *b*, *t*, *d* became in Primitive Germanic respectively *a*, *f* or *b̥*, *h* or *g*, *p*, *þ* or *ð*, *t*, whence they followed further transformations in the various Germanic languages.

And yet it is quite true that phonetic comparisons yield much more definite results as to historical relationship than the comparison of words. Why this should be so becomes evident if we consider the part played by sounds in language. In the first place, at any particular stage in the development of a language its phonetic system is strictly defined and closed, being at the same time in perfect agreement with the

[16] *Cf.* page 366. Thus Arm. *b*>*p*, *d*>*t*, *g*>*k*, *bh*>*b*, *dh*>*d*, *gh*>*g*.

articulation basis of the speaking community and with certain psychic tendencies of a decidedly discriminating nature. This basis of articulation and these tendencies are quite characteristic of the people that speak the language and give a sharply defined outline to the system of sounds with which they choose to work in their speech. So characteristic are these peculiarities that hardly ever does a language take over a ready-made sound from elsewhere. In the course of time practically any possible sound may develop into the system of a language, but only in agreement with a gradual displacement of the basis of articulation and of the psychic tendencies mentioned. It is extremely rarely that linguists can point out an incontestable case of immediate sound borrowing. Even where such cases do occur as the result of extraordinarily favorable circumstances, the borrowed sound is often rejected again at a later stage of development. Germanic *h* and *w* were temporarily adopted by the people of Northern France, but they were eventually eliminated.[17] Thousands of foreign words have been borrowed by the English language, but the English people have always reshaped and remolded them according to the prevailing system of their own sounds. In the second place, in any language millions of different combinations are produced with a comparatively small number of phonemes, which is possible only if every sound is employed a great many times in various phonetic groupings. It is against the economy of a language that a sound should be used only once or twice. Consequently, the borrowing of a foreign sound would entail its systematic reproduction in any number of analogical cases. Suppose the nasal vowel were borrowed by the English people from the French in a word like *nation*. The prevailing phonetic economy would naturally induce the nasalization of the same suffix in *station*, *probation*, and many

[17] *Cf.* Wilhelm Meyer-Lübke, *Grammaire des langues romanes*, I, pp. 37*ff*. See also on page 106 of this book.

other words. Sounds are not such independent, loose entities as words;[18] their systematization is so close that every loss or addition spreads over the whole field of possible combinations and is magnified and intensified by countless realizations of one productive innovation. It may happen, of course, that owing to foreign influence a sound in a particular word is changed into one which is otherwise familiar to the language influenced because it is represented in its phonetic system.[19] Such a change does not entail any sweeping consequences and will not assume the character of regular phonetic correspondence throughout the vocabulary of the borrowing language. The result will be only an isolated irregularity in the phonetic make-up of one word. But aside from that, there is practically no phonetic borrowing in language, however great the number of word importations. The sounds of a given language have developed naturally from within, they have not been imported from without. The value of this statement for comparative purposes is seen at a glance. If two languages show regular phonetic parallelisms and if we succeed in discovering a sufficient number of them in words which we temporarily and hypothetically consider related, as was the case, for instance, where we noticed that French-Latin *c* (= *k*) regularly corresponded to German *h*, we may safely conclude that they are in some degree related.

Morphological Parallelism.—Finally, a good criterion of genealogical relationship is supplied by morphological resemblances. By this we do not mean general morphological procedures such as, for instance, inflection or deflection, but the concrete forms actually existing in particular languages. They likewise constitute a pretty coherent system whose

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[18] *Cf.* pages 39*ff.*, 104*ff.*

[19] For instance, Roman Latin *rufus* (='red') was borrowed from a non-Roman dialect. The regular Roman form would have been **rubus*. *Cf.* W. M. Lindsay, *The Latin Language* (1894), pp. 248, 289.

changes are effected not by foreign importation but by forces acting inside the language itself. The systems of verbal conjugation, of nominal and pronominal declension, as they actually exist in their concrete forms in German, in French, or in Latin are not borrowed. Regular parallelisms in such concrete morphological systems or in coherent parts of them will generally establish the common parentage of different languages. Abnormal forms are not seldom of greater evidential value than normal ones if they can be shown to be fossilized relics of ancient periods of linguistic history. The sporadically irregular conjugation of the indicative of the English verb *to be* points very emphatically to its Indo-European character, while in this respect a normal form like that of the French future (*jouerai, travaillerai*, etc.), as a new creation, is far less suggestive.

Status of Language Classification

From what precedes it may rightly be inferred that it is anything but easy to ascertain the pedigree of a language. In many cases, owing to the lack of records or to the absence of morphology by reason of radical isolation, an historical classification seems to be quite impossible with presently known methods. A complete classification will undoubtedly remain an ideal to be striven for. Yet several linguistic families have been solidly and scientifically established. Among these the Indo-European group occupies the most important place, but, besides, the Semitic, the Finno-Ugric, the Bantu, the Malay-Polynesian, the Caucasian, and the Dravidian families are today sufficiently well established. Most of the work has been done in languages with a written history; what is yet to be performed is much more difficult because it concerns languages whose past is not easily or not at all accessible.

CHAPTER X

THE INDO-EUROPEAN FAMILY

The Parent Language

Origin of Its Various Names

Several names have been given to the family of languages spoken in almost all European countries and a considerable part of Western and Southern Asia. The most commonly used labels are "Indo-European," "Indo-Germanic," and "Aryan." The latter designation, in this general sense at least, had better be avoided on account of its ambiguity. Strictly speaking, it applies only to one group of the whole family, namely, to Indo-Iranian. Etymologically *Aryan* is merely another form of *Iran*, but both in Indian and in Iranian the term is found as a proper name for their peoples. This reason by itself, of course, would not be sufficient to limit the application of the word to that particular group, since extension of meaning is quite a common semantic phenomenon. But if both a general and a restrictive meaning of a word are used indiscriminately in scientific works, unnecessary misunderstandings will result. The term "Indo-Germanic" is nowadays used, to the exclusion of all others, by German linguists, who strictly confine the name "Aryan" to the languages and dialects of the Indo-Iranian group. The two terms of the compound expression "Indo-Germanic" indicate the two extreme representatives that form the geographical outposts of the whole family. The linguists of Latin countries prefer the name "Indo-European", the two components of which point to the parts of the world, Europe and India, where the languages in question have had a par-

ticularly glorious history. English scholars have been using both terms, with a preference for Indo-European.[1]

The Primitive Indo-European Race

It is a well-known fact that we only have an empirical knowledge of Indo-European languages, not of the Indo-European language. In other words, we have no records at all of the original of which the numerous languages of the group are descendants. Proto-Indo-European must have existed, however. Various parts of the earth have been assigned to the people who spoke it—Central Asia, Scandinavia, the banks of the Danube, Germany, the Caucasus, the vicinity of the Semitic territory, etc. As a matter of fact, in the actual state of science it is impossible to determine either the time or the place of their existence. Nor do we know much of the degree of civilization of this ancient people. In any case, we should not make the mistake of considering their language as primitive, one from which we could draw specific information about the forces that must have contributed to the origin of human speech. It was a highly inflective language, well defined and organized, with a long history of development and growth, just as the very complicated languages of the American Indians accompany a culture which is otherwise rather primitive.

Furthermore, it must be remembered that racial and linguistic developments do not coincide.[2] As far as the Indo-European languages are concerned, we are able to show scientifically that they are historically or genealogically related, that is, that they descend from a common source, but when it comes to races, we have no such evidence. On the contrary, it is probable that no such thing as an Indo-European race exists. In the spreading of the original Indo-Euro-

[1] *Cf.* F. Norman, "'Indo-European' and 'Indo-Germanic'," *Modern Language Review*, Vol. XXIV (July, 1929), pp. 313–22.

[2] *Cf.* pages 338*ff.*

peans over vast territories of the world it was inevitable that a tremendous amount of racial mixing should take place. Just as the ancient Britons abandoned their Celtic language to adopt that of the Anglo-Saxon conquerors, many non-Indo-European peoples of Europe and Asia adopted the Indo-European language at the expense of their own. Even in historical times we can often witness that whole countries substitute a strange tongue for their traditional one. This accounts for linguistic islands like the Basque territory in the north of Spain and the south of France, where a non-Indo-European language has victoriously withstood the assimilating invasion of Indo-European. It also accounts for the fact that there is no racial difference between Esthonians of Finno-Ugric and Letts of Indo-European speech. There is no place on the whole Indo-European territory where we can locate pure Indo-Europeans, that is, people that descend from the original Indo-European stock without mixture. Such a pure-bred type simply does not exist.

Antiquity of Indo-European Records

The oldest Indo-European records that have come down to us through history, the hymns of the Vedas (16th to 20th century B.C.), show the features of a language that has already reached the stage of a thorough differentiation from the mother tongue. Only three groups of Indo-European languages have handed down documents antedating the Christian era, the Indo-Iranian, the Greek, and the Italic groups. As a reason for this, some scholars advance the theory that the Indo-Europeans began to write only when the Buddhist religion on the one hand and Christianity on the other introduced the factor of religious proselytism into the cultural life of the people. Others believe simply that it took the other branches so much longer to emerge as distinct languages. The linguistic features of Indo-Iranian are com-

paratively close to those of the parent idiom; Germanic documents do not appear until the beginning of the Christian era, when both the phonetic and the morphological systems had gone through a long and thorough process of change. Moreover, the causes of linguistic change were not equally favored by circumstances in the various parts of Indo-European territory. Some languages that appear relatively late in history show very archaic features, whereas others, known to us through older records, have completely changed their pattern. The Slavonic languages, and particularly Lithuanian, have evolved more slowly than the Germanic dialects. In this respect there are a great many degrees of relationship in the various Indo-European languages. In comparing their sounds, forms, and vocabularies with each other it is very important to keep in mind that the relative archaistic values of these features are far from being equivalent.

Reconstruction of the Parent Language

As we have already stated, we do not know the Indo-European language. But the field of Indo-European linguistics has by now been so thoroughly and extensively surveyed that by a process of careful comparison it has become possible to form an idea of what the parent language must have looked like. It has become possible, as it were, to reconstruct the mother tongue. However, there should be no misunderstanding as to what is meant by that reconstruction. We cannot put together a language as it lived, any more than anthropologists can reproduce living prehistoric beings. An instance where circumstances are especially favorable is that of the Romance languages. Here we not only have an appreciable series of historical records which permit us to understand what they were at different periods of their growth, but we also have very rich documents of their parent language, Latin. The Latin we know,

to be sure, was a literary, or a religious, or a scientific language, not the spoken Vulgar Latin out of which the Romance languages really grew and of which we have practically no records. But the classical and postclassical Latin sources we do possess are most valuable material for directing and testing purposes in the reconstruction of Vulgar Latin. Yet linguists cannot boast of having successfully brought to life again the parent language of the Romance group or of having established beyond doubt all its characteristic features. How much more difficult reconstruction would be in the case of Indo-European it is easy to see; no such testing or directing material is at our disposal, and its much greater antiquity creates heaps of other difficulties for its theoretical reorganization.

What, then, does this famous reconstruction of Indo-European really amount to? The best thing comparative grammar is scientifically entitled to do is to disengage from the organic material of the various Indo-European languages regular sets of corresponding phonetic, morphological, and syntactical facts. For instance, in the phonetic field a careful comparison reveals the following regularity: Indo-Iranian *p* corresponds to Greek *p*, to Latin *p*, to Parent Germanic *f* or *ƀ*, to Lithuanian *p*, to Slavonic *p*, to Armenian *h* or *w*. Hence we infer that to this systematic parallelism of sounds there must correspond one sound in the Indo-European parent tongue. By so disengaging from all Indo-European languages known to us all the regularly corresponding sounds we reach the conclusion that Parent Indo-European must have had at least as many sounds as there are such regular sets in the daughter languages. From the simplicity of the illustration given it should not be inferred that this task of comparative grammar is an easy one. It takes more than ordinary sagacity, knowledge, and caution to avoid the numerous traps that lie on the way to conclusively corresponding sets and their interpretation. Here, however,

we are interested only in pointing out the general methodological procedure.

What was the exact nature of these original Indo-European sounds? At this we may guess, but our guess will lie outside of the realm of knowledge; it will be an hypothesis only. What is true of the sounds is applicable also to forms and syntax. Surely, many of these hypothetical inductions have a good chance of being correct, and if we are able to collect a large number of them, it will be possible to obtain a fairly good picture of the general system of the language. But as to each individual form and its exact material make-up we may be mistaken either in full or in part. It often happens that corrections are necessary as the result of new discoveries or the emergence of certain factors that had escaped the notice of the linguists. Up to about 1876 it was generally believed that Indo-European had only three vowels, namely, *ă*, *ĭ*, and *ŭ*, because in Indo-Iranian the one vowel *ă* regularly corresponded to either *ă*, *ĕ*, or *ŏ* of the other Indo-European languages. But later it was noticed that in Indo-Iranian original velar consonants followed by *ă* were regularly palatalized whenever this Indo-Iranian *ă* corresponded to *ĕ* in the other Indo-European dialects; which showed very clearly that this one Indo-Iranian *ă* must answer to different vowels of the parent language (Palatal Law).[3] This became still more evident when the ablaut phenomenon of the strong verbs in Greek and Germanic came to be better understood. The parent language may have had other sounds, other forms, and other syntactical characteristics than those which comparative grammar is able to infer, and those which are so inferred may have been slightly or substantially different. There can be no question, therefore, of a real reconstruction

[3] This law was discovered more or less independently by various scholars. Its formulation can be given as follows: In Aryan, gutturals are palatalized before *a* when it corresponds to European *e*; they remain unchanged when Aryan *a* corresponds to European *a* or *o*.

of Indo-European; there are only hypothetical formulae (usually designated by an asterisk), the sum of which has been steadily increasing and may give us a more or less accurate idea of the general aspect and framework of the language, but which will always remain far short of the living language.

Stability of the Genealogical Classification

One great advantage to the genealogical classification is the stability of value as regards not only the classifying rubrics but also their application to the languages classified. This results from the circumstance that such classification is not essentially based upon idiosyncratic qualities of the related languages but upon an historical fact of original identity. An historical fact is an unchanging and indivisible value; two or more languages either have the same common source or they do not. From a strictly historical standpoint English is Indo-European with the same right as Lithuanian or Sanskrit, no matter how much closer the latter may be to the mother tongue in time, space, or linguistic qualities. As to the linguistic change effected in various historically related languages, there may be a great many degrees; but it is by no means proportional to the distance in time or space that separates them from their common source. Modern Persian has lost practically all inflection, whereas Modern German has preserved a good deal of it. Linguistic change depends upon many other circumstances than geographical distance or the period of separation. The question how it happens that certain Indo-European languages show more mutual resemblances than others is therefore a legitimate one, and in this connection several theories have been put forward.

Schleicher's Pedigree Theory

A great mistake made by August Schleicher when he advanced his well-known "Stammbaumtheorie" in his *Compendium der vergleichenden Grammatik der indogerman-*

ischen Sprachen (1866) was that he did not take into account other causes of linguistic change than distance from the parent tongue. According to Schleicher, Primitive Indo-European split into two branches, first into Slavo-Germanic and then into Aryo-Greco-Italo-Celtic. The former branch bifurcated into Slavo-Lithuanian and Germanic, the latter into Aryan and Greco-Italo-Celtic, which in its turn was divided into Greek and Italo-Celtic, etc.[4] He so obtained a regular pedigree, the different branches of which were straight lines and at the same time indicated the degrees of linguistic relationship. Since according to him the cradle of Indo-European was Central Asia, the more westerly the location of an Indo-European idiom, the earlier it must have been separated from its source and the less archaic its features must be; the more easterly, the more recently it must have been detached and the fewer features of a new or non-common Indo-European character it must possess.

It was soon realized that this theory was not borne out by the facts. It is not true that the languages of the Slavonic branch have in every respect more modern features than the Aryo-Greco-Italo-Celtic group, as would be the case if Slavo-Germanic had been the first group to part from Primitive Indo-European. As a matter of fact, the Slavo-Lithuanian languages bear some striking resemblances to Indo-Iranian, so striking that they are often classified under the generic name of "*satem* languages" as against those of the "*kentum*" group, terms which will shortly be explained. Schleicher tried to explain these phonetic coincidences as mere accidents without any causal connection. But later research has shown that, for instance, Italic and Celtic have more in common with Germanic than has Slavo-Lithuanian. The theory that there ever existed a Slavo-Germanic parent language, as indeed the principle itself of a series of suc-

[4] *Cf.* page 159. See Schleicher, *Compendium*, pp. 2, 5, 7.

cessive bifurcations, has entirely lost its plausibility. If the splitting of Indo-European languages had resulted in producing straight and continuous branches, as Schleicher would have it, there should be no sharp boundary line between two groups which according to the assumed pedigree are related in the first degree.

Schmidt's Wave Theory

An attempt at meeting these objections was made by Johannes Schmidt in his *Die Verwandtschaftsverhältnisse der indogermanischen Sprachen* (1872). He suggested that the differentiation of Indo-European was effected not in the way of straight descendance, but of numerous circles overlapping each other like waves. He so accounted for each group having certain points in common with one branch and certain others with another, for instance, Celtic with both Italic and Germanic. This view also squares very well with the conclusions arrived at by modern dialectology. The study of modern dialects has shown that they do not bifurcate in straight lines, but that, for example, dialect *A* has certain features in common with dialects *B* and *C*, others with dialects *C* and *D* but not with *B*; that dialect *B*, on the other hand, shares some phenomena with dialects *C* and *D* but not with dialect *A*, etc. Each dialectal peculiarity leads its own life with apparent independence of the others. If we represent each of these peculiarities by a line connecting all the points where it prevails, we obtain a number of curved lines crossing each other in a most capricious manner. Such lines are called *isophones* if the individual phenomenon concerned in each is of a phonetic character; they are *isoglosses* if the feature in question pertains to morphology, vocabulary, or syntax. As to the absence of transitional stages between neighboring groups, Schmidt's theory accounts for this by the spreading of some dialects over larger areas at the expense of others, which is also incontestably supported by the facts.

Certain dialects aided by happily concurring circumstances usurp large territories and exterminate others as they move on. In this way two varieties that used to be separated by a chain of intermediate links become immediate neighbors with sharply differentiating features.[5] Here, too, we find the idea of the slowly rising and engulfing movement of a wave.

Linguistic Mixture

The flaw in this wave theory, as indeed in Schleicher's pedigree explanation, is that the actual geographical arrangement of the Indo-European languages is assumed to point to original conditions of differentiation. Consequently, more thought has recently been given to the historical circumstances under which Indo-European has spread. Many facts can be understood only in the light of these conditions, particularly as regards the very considerable deviations that are to be noticed between various groups from the very beginning of their appearance in history. When a people substitutes a strange language for its own, it is inevitable that the former should undergo important changes in the mouths of those whose linguistic tradition had been so different before. As far as the sounds are concerned, the result is bound to be a compromise between the two contrasting habits of articulation, especially when certain sounds were unfamiliar to the speaking community that gives up its language. Vocabulary, morphology, and structure evolve into something which differs in various degrees from what they were before and from what they would have become if the language had not been grafted upon alien subjects. Many striking phenomena are probably to be explained in this manner. The fact that Sanskrit possesses cacuminal dentals may possibly be accounted for by its spreading over Dravi-

[5] *Cf.* page 322.

dian territory, where those particular sounds are quite commonly found in the Dravida dialects. The Germanic sound shifting may be the result of a compromise between the articulation system of non-Indo-European spoken on the Germanic territory and that of Indo-European.[6] The genius for organization and conquest of the peoples of Indo-European speech was and still is extraordinarily great, as may be seen from the huge domains they have covered in the course of history. The mixing of Indo-Europeans with linguistically different communities results everywhere in a rapid transformation of the language. Where a population is generally stable and has been confined for long periods to the same territory and to descendants of the same people, the language will move slowly and straight, with few sudden leaps; naturally it will show more archaic features than another language of the same age but with a history of migration and expansion. The mixing of the Boers with people of Malay-Portuguese tongue, with French Huguenots, with South African natives, and with Anglo-Saxons has brought about such far-reaching changes in their mother tongue that South African Dutch is very near becoming a different language, showing all the characteristics of a very advanced stage of deflection. On the contrary, the long stability and the confinement of the Lithuanians to chiefly rural settlements have caused their language to preserve a great many ancient characteristics.

Relative Unity of Primitive Indo-European

The numerous facts that have been collected in the comparison of Indo-European languages point to a coherent unity of the parent tongue. We have stated that nothing

[6] *Cf.* page 226. See H. Meyer, "Ueber den Ursprung der Germanischen Lautverschiebung," *Zeitschrift für deutsches Altertum*, Bd. XLV (1901), pp. 101*ff.*; Edward Prokosch, "The Hypothesis of a Pre-Germanic Substratum," *Germanic Review*, January, 1926.

can be advanced in favor of the existence of an Indo-European race; nor is it likely that the original Indo-Europeans formed a political unit with a central or federal government. But during an indeterminable period of time before their dislocation and scattering they must have been united by ties of civilization which caused their language to be distinctly unified. It is this relatively homogeneous language that is meant when we speak of Primitive or Parent Indo-European. How long this unity of speech lasted, under what conditions its unification came about, whence the elements came that gradually combined to build it up, these are questions we are not in a position to answer. We know nothing definite about its previous stages of evolution, although certain guesses may be made on the strength of more or less suggestive facts and inductions. We have no points of comparison in the way of sister languages of the Indo-European parent tongue. There are interesting coincidences, especially in regard to vocabulary, which suggest a possible relationship between Indo-European and Finno-Ugric or between Indo-European and Semitic; but they are insufficient to allow of any definite conclusions.[7] The future will perhaps succeed in assembling a larger number of corroborating facts so that a sound comparison of various parent languages may lead to a better knowledge of the linguistic conditions of pre-Indo-European, pre-Semitic, etc. The deciphering of cuneiform writings (tablets) of Asia Minor has led to the identification of a language called Hittite, possessing a decidedly Indo-European morphology on the one hand, but with a seemingly large number of non-Indo-European features as regards its vocabulary, phonetics, and syntax. The theory has been advanced that Hittite was perhaps a sister language of Parent Indo-European or a descendant of such a sister language, in which case a further study of the Hittite material would be of the

[7] *Cf.* Hermann Möller, *Semitisch und Indogermanisch* (1907).

greatest importance for the elucidation of pre-Indo-European developments.[8]

Original Isoglosses

In spite of the relative unity of the Indo-European parent tongue, we must not think that all the peculiarities of the subsequent daughter languages were caused by special conditions which arose after the original unity was broken. No living language is ever completely homogeneous, especially when it covers an area of some importance. We must think of Primitive Indo-European as of any spoken language in which forces of unification are continually counteracted by forces of disintegration but with the former temporarily more powerful than the latter. Local and dialectal differences, therefore, were not absent; there were isoglosses and isophones which contained the germs of later developments. In proportion as conditions of various kinds weakened the ties of unification, those germs grew and expanded, so that many peculiarities in the daughter languages are to be traced to original Indo-European differentiations. It is not easy, of course, to determine which of them are due to such original isoglosses and which are the result of later conditions. It will do to mention here two of the most striking features that are often considered as having their roots in dialectal differences of the parent language.

"Kentum" and "Satem" Languages

The Indo-European series of palatal occlusives $\hat{k}$, $\hat{g}$, $\hat{gh}$ appear in the daughter languages as spirants or affricates on one hand, as occlusives on the other. Thus, Parent Indo-

[8] *Cf.* Friedrich Hrozný, *Die Sprache der Hethiter, ihr Bau und ihre Zugehörigkeit zum indogermanischen Sprachstamm* (1917), *Hethitische Keilschriften aus Boghazkoï* (1919); E. F. Weidner, *Studien zur hethitischen Sprachwissenschaft* (1917); E. H. Sturtevant, "On the Position of Hittite among the Indo-European Languages," *Language*, Vol. II (1926), pp. 25–34.

European *kṃtóm* corresponds to Gr. *hekatón*, to Lat. *centum* (*c* = *k*), to Welsh *cant*, to Goth. *hund* (*h* < *k*), whereas on the other hand it corresponds to Skr. *çatam*, to Zend *satem*, to O. Slav. *suto*, to Lith. *simtas*. Similarly, Gr. *oîkos* < *woikos* (= 'house') corresponds to Lat. *vīcus* and to Goth. *weihs*, but on the other side to Alb. *vis*, to Skr. *visam*, and to Zend *visəm*. From the two forms *kentum* and *satem* for the word *hundred*, the languages in which I.-E. *k̂*, *ĝ*, etc., are preserved as gutturals are called *kentum languages*, the others *satem languages*.[9] The former are chiefly represented by the western groups, namely, Greek, Italic, Celtic, and Germanic; the *satem* languages are found mostly in the eastern half of Indo-European territory, that is, Indo-Iranian, Slavo-Baltic, Armenian, Albanian. On the basis of this different treatment of *k̂*, *ĝ*, etc., and on account of the striking geographical cohesion of the two groups, it has often been argued that there must have been a dialectal split in Parent Indo-European which would account for this bifurcation into an occidental and an oriental branch. In connection with this theory, however, it should be carefully remembered that even if this peculiarity be due to an original isophone, this fact would in no way prove that there really were two distinct dialectal units in Parent Indo-European. We have seen how independent of each other isophones are. Dialects which share one do not share the others. It is entirely arbitrary to divide Indo-European into *kentum* and *satem* languages, as if they were two coherent groups each comprising a certain number of more closely interrelated dialects. With the same right any other isophone or isogloss might be chosen as a basis for a similar classification. Besides, it often happens that the same phenomenon prevails in different languages without any other explanation than accidental coincidence. The same forces may very well act independently and par-

[9] *Cf.* Peter von Bradke, *Ueber Methode und Ergebnisse der arischen Altertumswissenschaft*, p. 63.

allelly in different languages and produce the same results. This is especially likely to occur in dialects that are historically related and have, therefore, received the general direction of their development from the same source. Thus, for instance, I.-E. *b*, *d*, *g* have become *p*, *t*, *k* both in Germanic and in Armenian without there being any direct relationship between the two parallel developments.[10] As for the geographical cohesion of the *kentum* and the *satem* groups, it is by no means flawless. Tocharian of Central Asia is a *kentum* language, and some scholars point out that Sanskrit itself, in its earliest forms, did not as a rule have affricates or spirants instead of the Indo-European palatal plosives, but that it, too, had generally stops like the *kentum* languages.[11] It is even possible that the gutturals of the *kentum* group and the sibilants of the *satem* languages do not at all come from an original set of Indo-European palatal stops, but that Primitive Indo-European sounds were spirants and the stops of the *kentum* dialects, instead of being original, are due to linguistic mixture.[12]

In addition to the characteristic just described, the *kentum* and *satem* languages apparently possess another distinction which is supposed to run parallel to the first and is for the same reason accounted for by original Indo-European conditions. In Primitive Indo-European there was a set of velar plosives pronounced with a labial rounding (more or less like *k* in Germ. *Kuh*). They are called *labio-velars* and are generally written k^w, g^w, g^wh. In the *kentum* languages they appear the same as in Indo-European, or, at any rate, they usually[13] keep the labial element. For instance, Lat. *quis*,

[10] *Cf.* page 348; also Hermann Hirt, *Indogermanische Grammatik*, I (1927), p. 223.

[11] *Cf.* Leonard Bloomfield, "The Indo-European Palatals in Sanskrit," *American Journal of Philology*, Vol. XXXII (1911), pp. 35–58; Sturtevant, *loc. cit.*, p. 26.

[12] *Cf.* Pandit Lachmi Dhar Kalla, *The Home of the Aryas*, Delhi University Publications, No. 2 (1930).

[13] *Cf.* Hirt, *op. cit.*, I, pp. 24–25 and 229.

Goth. *hvas*; Goth. *qiman* (in Dutch the past tense of the verb *komen* = 'to come' still is *kwam*), Lat. *venio* ($v < g^w$); Lat. *linquo*, Goth. *leihva*, Gr. ἔλιπε. In the *satem* languages, on the contrary, the labial element has been dropped and we have simple velars, which sometimes become affricates. For instance, Skr. *káh* ('who'), Skr. *cit* (= Lat. 'quid'), Zend *cis* ('who'), Lith. *kas* ('who'), O. Bulg. *kuto* ('who'), Arm. *elik* ('he lost'), Lith. *liku* ('I let'), Arm. *ekn* ('he came'). Sometimes both these characteristics are given as equally distinctive of the division into *kentum* and *satem* languages, as if they were always present parallelly together. But as far as Tocharian is concerned, there seems to be agreement with the *kentum* languages in regard to the treatment of Indo-European palatal plosives, but with the *satem* languages in regard to the labio-velars. A similar condition seems to prevail in Venetic,[14] a language related to Illyrian and perhaps to Albanian. Hence, although the distinction between *kentum* and *satem* is interesting from the point of view of phonetic parallelism, it would hardly be justifiable to use it as a basis for the classification of Indo-European into two distinct units or groups.

Reconstruction of Other Parent Languages

Just as it is possible to reconstruct Parent Indo-European by a scientific comparative method, we can also rebuild Parent Germanic, Parent Slavonic, Parent Celtic, Parent Greek, etc. By this we mean that, for instance, from a large number of corresponding sets of features in the various Germanic languages we are able to disengage many common Germanic peculiarities which must have been realized in Parent Germanic before the appearance of the first Germanic docu-

[14] *Cf.* Joshua Whatmough, "On the Phonology of the Messapic Dialect," *Language*, Vol. III (1927), p. 226; Sturtevant, *loc. cit.*, p. 28; Ferdinand Sommer, "Zur venetischen Schrift und Sprache," *Indogermanische Forschungen*, Bd. XLII (1924), pp. 90–132.

ments. We know nothing empirically of these parent or common languages; at the time when they were first written, their former relative unity had already been broken up into various dialects.

The Daughter Languages

Indo-Iranian

Indo-Iranian comprises the two distinct but closely related groups of *Indian* and *Iranian.*

INDIAN

Indian is known in old, middle, and modern forms.

1. *Old Indian or Sanskrit*

The oldest form of Indian we know is that of the Vedas (*Veda* = 'knowledge'), that is, of collections of hymns, prayers, magic formulae, etc., the date of which cannot be ascertained but the oldest of which, judging from both contents and linguistic form, are thought to go back as far as the 15th or even the 20th century B.C. The Vedas have not been transmitted in their original form, and they comprise parts of very different antiquity, the most archaic being those of the *Rig-Veda,* the collection of praise songs. The language of these is probably based on the dialect of Northwestern India, Punjab. It represents a language which was used and understood by educated Indians, especially Brahmans, while the lower classes spoke various vernacular dialects of a less stereotyped and rigid character. In the course of time, however, the language of the Vedas became gradually restricted to literary and scientific uses, thus growing more and more away from the spoken idioms. The language of the *Rig-Veda* is already formular and artificial enough to suggest the existence of a previous literary tradition. The magic formulae of the *Atharva-Veda* show linguistic features of less ancient char-

acter, and the prose commentaries on the Vedas, the so-called *Brahmana*, as well as the philosophic treatises called *Upanishads* are written in a language which comes very near classical Sanskrit as codified by Panini. The linguistic form of the great epics in verse *Mahabharata* and *Ramayana* and of the collection of fables *Pantšatantra* differs only little from this classical Sanskrit although they antedate Panini's codification. Panini was one of the numerous Indian grammarians who definitely fixed the rules of literary and scientific Sanskrit, probably in the 4th century B.C. This form, known by the name of *Classical Sanskrit*, has been used for literary and scientific purposes up to modern times. Its function and importance are comparable to those of Latin during the Middle Ages and the time of the humanists.

2. *Middle Indian*

Local dialects, of course, had always existed and went on existing. But because they were not written, or, at least, because none of their documents have been handed down to us, it is impossible to learn very much about them. But during the Old Indian period there had gradually developed various literary languages called *Prâkrits*, which were considerably closer to the spoken dialects than the increasingly artificial Sanskrit. We know them only in their Middle Indian forms (4th century B.C. to 6th century A.D.). They were common languages extending to rather large territories and resorted to by literary authors, especially dramatists. As such they were spoken nowhere, but they were understood all over their respective territories as compromises between various dialects. The oldest Middle Indian documents date from the 3d century B.C. All the Prâkrits seem to be derived from a dialect not much different from that upon which the *Rig-Veda* is based.

Besides these literary Prâkrits and the local dialects, there were also religious languages, among which the so-called *Pali*

is the most important. It was the language of the Buddhism of the South.

3. *Modern Indian*

In our day Indian dialects are spoken in India by more than 200 million people. They are bordered in the northwest by Iranian, in the northeast by Tibeto-Burmese, in the east by the Munda dialects, in the south by the Dravida dialects. Besides, the southern half of the island of Ceylon speaks Indian. Some of these idioms once were, or still are, used for literary purposes, some exist merely as spoken varieties. They form several groups, such as the Himalayan, the Western, the Central, the Eastern groups. Among the most important representatives are the *Hindustani*, the *Bengali*, the *Marathi*, and the *Hindi*.

The language spoken by the *Gypsies* is also an Indian dialect from Northwest India. But because of the nomadic life of those who spoke it, it has been everywhere contaminated by the languages of the countries into which the Gypsies migrated. The idiom spoken by the Armenian Gypsies is actually Armenian from a grammatical point of view, but with an Indian vocabulary.

IRANIAN

Iranian also is known in its old, middle, and modern forms.

1. *Old Iranian*

Of Old Iranian (from the beginning to about the 4th century B.C.) we possess only scarce documents, representing two dialects, *Old Persian* and *Avestan* or *Zend*. *Old Persian*, which is Western Iranian, has been transmitted through cuneiform inscriptions covering the period from Darius I (521–485 B.C.) to Ataxerxes III Ochos (358–337 B.C.). *Avestan* or *Zend* is the language of the *Zend-Avesta*, the holy books of

Zoroaster's religion, whose transcription, however, only dates from the time of the Sassanidae (226–641 A.D). Strictly speaking, *Avesta* alone applies to the fundamental text of Zoroaster's bible, while *Zend* really designated its Middle Persian translation and commentary. Nowadays both terms are used indiscriminately, or also together (*Zend-Avestan*), to indicate the Old Iranian of the *Avesta*. For although the latter was only transcribed in the Middle Persian period, it comprises texts from distanced times, some of them very old. The *Gathas*, a collection of Avestan hymns, for instance, are presented in a linguistic form whose archaic character is considered at least equivalent to that of the *Rig-Veda*.

2. *Middle Iranian*

The first Middle Iranian documents we possess date only from the Christian era, but they show a considerably advanced degree of linguistic development. The Middle Iranian period is usually considered to cover approximately the time between the 4th century B.C. and the 7th century A.D. The so-called *Pahlavi* is the Middle Persian dialect directly derived from the old Persian cuneiform inscriptions. Other Middle Iranian documents, especially known through recent discoveries, represent the *Sogdian* and *Saka* dialects.

3. *Modern Iranian*

The most important Modern Iranian form (from the 8th century to the present) is represented by *Modern Persian*, which is a straight development of Pahlavi. It appears in history in the 9th century and hence becomes the vehicle of a very rich and variegated literature. It has become the common language for almost the entire Iranian territory and as such has undergone comparatively few changes. The number of words that it has borrowed from Arabic is extraordinarily great.

Besides and along with Persian many other Iranian dialects of varying importance are spoken over large areas of Asia. The chief among them are the *Caspian*, the *Kurdish*, the *Baluchi*, the *Pamir*, the *Afghan*, the *Yagnobi*, and the *Ossetic* dialect. The latter is only spoken by some seventeen thousand people who are living on Caucasian territory, entirely surrounded by non-Iranian idioms.

Tocharian

At the beginning of the present century fragmentary texts discovered in East Turkestan have revealed the former existence of two dialects of an Indo-European language which linguists have agreed upon calling *Tocharian*. Its exact characteristics have not yet been established, but, as already noted, it apparently agrees with the *kentum* group in regard to its treatment of the Indo-European palatals, with the *satem* languages in regard to that of the Indo-European labiovelars. The time of its existence cannot be determined, but it is thought that it must have been before the 10th century A.D. It does not seem possible to classify Tocharian as a language belonging to any other Indo-European group; it represents a branch by itself.[15]

Armenian

Armenian is now spoken by approximately four million people. Its real home is around the border line of Asia and Europe, between Mesopotamia, the southern parts of the Caucasus, and the southeast shore of the Black Sea. But

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[15] *Cf.* Sigmund Feist, "Der gegenwärtige Stand des Tocharerproblems," *Ostasiatische Zeitschrift*, Bd. 8 (1920); Antoine Meillet, "Le Tokharien," *Indogermanisches Jahrbuch*, Bd. I (1913), pp. 1–20; Julius Pokorny, "Die Stellung des Tocharischen im Kreise der indogermanischen Sprachen," *Berichte des Forschungsinstituts für Osten und Orient in Wien*, Bd. 3 (1919), p. 30; Emil Sieg und Wilhelm Siegling, "Tocharisch," *Sitzungsberichte der Königlich Preuszischen Akademie der Wissenschaften*, Berlin, 1908, pp. 915–34.

many settlements of Armenians use their mother tongue in various parts of the world—in Persia, India, Egypt, Turkey, Bulgaria, Rumania, the United States. For a time Armenian was deemed to be an Iranian dialect on account of the large number of Parthian (Persian) words in its vocabulary. It has been conclusively shown, however, to form a branch by itself, in fact, more isolated than other Indo-European groups.[16] Armenian is first recorded in a translation of the Gospel of the 9th century A.D., whose language, however, is supposed to go back to the 5th or 6th century. It has since been used in various works, literary, historical, or religious, as a classical language, subject to very little change in the course of time. Simultaneously various spoken dialects have flourished and grown more and more away from the "grabar" or written language. On the whole, these modern dialects are not used for literary purposes; they all are very much alike, so that Armenians speaking them are not unable to understand each other.

Hellenic

When Indo-European spread over the territory now known as Greek, it did so gradually, in various stages, and met on its way with peoples of different races and languages of which we know practically nothing. It is not surprising, therefore, that *Greek* in its earliest form already possesses sharply dialectal features. The oldest records of Greek, in the form of inscriptions, probably date from the 7th or 8th century B.C. From the 5th century on inscriptions are very numerous and constitute valuable material for the linguist. Aside from the Homeric writings, literary texts appear considerably later. The language revealed by those early documents is decidedly dialectal, but the various dialects that they represent were not sufficiently idiosyncratic to destroy the feeling

[16] *Cf.* Heinrich Hübschmann, *Kuhns Zeitschrift*, Bd. XXIII, pp. 5*ff*.

of unity among all the Greeks. In spite of the mixed character of most of these dialectal varieties, a few large groups can be distinguished, such as those of the *Ionic-Attic*, the *Achæan*, the *Æolic*, the *Doric* dialects, etc. Each group comprises a number of secondary varieties. Their importance is far from being the same. Attic and Ionic have had an extraordinarily glorious literary history. Some of them developed into common languages, used over larger areas as a result of provincial needs of communication. Such a common language was called *koinê diálektos*; there was, for instance, a Doric, an Attic, an Ionic *koinê*. Gradually, however, especially from the 4th century B.C. on, the Attic *koinê*, with considerable ingredients of Ionic vocabulary, became the language of all Greeks. The result was that practically all the old dialects died out. The numerous idioms at present spoken in Greece are derived from Attic; they do not go back to the other old dialects mentioned. Modern spoken Greek in its various forms is also called *Romaic*; its history from the time of the disintegration of the Attic *koinê* is only partly known. It is being spoken in continental Greece, on the islands of the Ionian and Ægean seas, in various places of Asia Minor, and by Greek settlements in Egypt, Italy, North America, etc.

Ancient history mentions several languages north of the Hellenic territory of which we have only a few proper names and glosses. *Thracian*, *Phrygian*, and *Macedonian* were Indo-European idioms which perhaps acted as links between Armenian and Greek.

Albanian

Albanian is spoken by approximately one and a half million people in Albania and some settlements of Greece, Italy, Sicily, Dalmatia, and North America. By some it is thought to be descended from an Indo-European group called *Illyrian*, of which there are few inscriptions extant, and even these

are only partly deciphered. It probably constituted a transition between the Greek and the Italic groups. The earliest records of Albanian only date from the 17th century A.D. Its vocabulary presents a very large number of words borrowed from Latin, Greek, Turkish, Slavonic, and Italian.

Two other languages, namely, *Venetic* of Northeastern Italy and the South Italian *Messapic*, both of which are little known, seem to have belonged to the Illyrian branch.

Italo-Celtic

Italo-Celtic was probably once a common group of closely related dialects. When they appear in history, Italic and Celtic still have many features in common but are sufficiently differentiated to constitute two separate branches.

ITALIC

The only language of the *Italic* group that has survived is *Latin*, with its descendants the *Romance languages*. But before Latin had spread over the entire Roman territory, there existed other Italic idioms, some of which may have disappeared without leaving any vestige. We know, however, a few of these former sister dialects of Latin. *Oscan* was spoken in Samnium, Campania, Lucania, Bruttium, Apulia, and Messana. It has been transmitted to us in a number of inscriptions and was probably still alive in the 1st century A.D. *Umbrian* was used between the Apennines and the left bank of the Tiber. A few ritual fragments, which antedate the Christian era, are preserved. We do not know when it ceased to be spoken.

Latin

Latin was originally the dialect of the city of Rome. Several other unimportant dialects, cognate to Latin and spoken in the surrounding country, were soon absorbed by the more

powerful language of the city. At the beginning, Latin was very homogeneous, by reason of its being limited to such a small district; but soon it extended to larger and larger areas, absorbing Oscan, Umbrian, and the other Italic dialects as well as the Celtic and Illyrian dialects of Italy and Sicily. As a result of these contacts, Latin itself became more altered and variegated. In the meantime, written Latin developed into a classical language which became the vehicle of a very prolific and important literature. This caused the spoken idioms to grow widely different from the Latin of the books. Written Latin in its artificial and fixed form survived the Roman Empire by many centuries, as it continued to be used as the scientific language during and beyond the Middle Ages and was even revived at times for literary purposes. To this day it is the official language of Roman Catholic theology and liturgy.

Romance Languages.—In due time the Roman colonists imposed their dialects upon the greater part of the Roman Empire outside of Italy. But when the ties that united the various Roman provinces became looser and were finally destroyed as a result of the invasions of the barbarians, a real anarchy prevailed among the vernacular varieties of speech scattered over such a huge territory. Their independent development and their contact with so different conditions in different areas favored the formation of entirely distinct idioms which are known by the name of *Romance languages.* In this process of new formations some dialects, less aided by circumstances, either disappeared or survived only as patois; others, more fortunate, succeeded in usurping larger districts or became the mediums of literature and intellectual intercourse. Several of them developed into national languages with extraordinary powers of expansion. The actually existing Romance groups may be listed as follows:

1. *Italian group*, with numerous dialects all over Italy, Sicily, Sardinia, and Corsica. The *Tuscan* variety of Flor-

ence has become the national and literary language of Italy. The oldest literary record dates from 964 A.D.

2. *Rhæto-Romanic* or *Ladin group*, of the old Roman province of Rhætia, spoken in three dialects in the Swiss canton of the Grisons, in Tyrol and Friaul.

3. *Rumanian group*, comprising three or four dialects used in Rumania, Transylvania, parts of Greece, and in Istria. Rumanian possesses a literature from the 16th century down.

4. *Provençal group*, with different varieties: *Provençal, Languedoc, Auvergnat, Limousin, Gascon.* Its oldest literary document is from the beginning of the 11th century.

5. *French group*, with its subdivisions: *Poitevin, Norman, Picard, Walloon, Lorrainese, Burgundian, Champenois, Ile-de-Français, Dauphinois, Vaudois, Valaisien, Savoyard,* and a few others. The dialect of the Ile-de-France and especially of Paris has supplied the basis for the national and literary language of the French. The well-known oaths of Strassburg are its oldest text (842 A.D).

6. *Catalan group*, the oldest text of which dates from 1171.

7. *Portuguese group*, comprising also the Galician dialect. Literary Portuguese is first recorded in a charter of 1192.

8. *Spanish group*, with the *Castilian, Andalusian, Aragonese,* and *Leonese* dialects. Literary and national Spanish is based upon the Castilian variety. Its first literary record is from 1145.

The Jews of Spain and Portugal have developed a special language known as *Sephardic*, from *Sephardim*, the name by which the Spanish Jews designate their race. Its grammatical basis and a good deal of its vocabulary are Spanish, but many Semitic elements have penetrated it. Emigrating Jews have carried it into various parts of the world, especially into large cities.[17]

[17] *Cf.* Jul. Subak, "Zum Judenspanischen," *Zeitschrift für romanische Philologie*, Bd. 30 (1906), pp. 129–86.

Since the 16th century several Romance languages have conquered considerable parts of the globe outside of their respective countries. Portuguese is spoken in Brazil; Spanish in South and Central America, in Mexico, in parts of Texas and California, in Morocco and Algeria; French in Quebec, the Antilles, North Africa, and the French colonies; Italian is found in North American and Argentinian settlements, on the North African coast, and in the Italian colonies. In several instances Spanish, French, and Portuguese have mixed with the idioms of uncivilized indigenous tribes and have thus resulted in very interesting mixed or creolized languages.

CELTIC

Before the Christian era *Celtic* was spoken over extensive parts of Europe, comprising Ireland and Great Britain, parts of France, Belgium, Switzerland, Germany, Spain, Italy, Greece, and reaching as far east as Asia Minor. On the Continent it was stifled by other Indo-European languages and left very few vestiges behind. But the insular branch of Celtic in Ireland and Great Britain has either survived in the form of living idioms or left records of dialects now extinct. There are two main groups of insular Celtic:

1. *Briton* is used in various parts of England and in Brittany, France, as follows:

(*a*) *Kymric* or *Welsh*, located in Wales and known from the 8th century.

(*b*) *Cornish*, evidenced by documents from the 9th century. It died out at the end of the 18th century.

(*c*) *Breton* or *Armorican*, still spoken by more than a million people in Brittany, whither it was imported in the 5th and 6th centuries by English emigrants. It comprises several dialects.

2. *Gaelic* was originally confined to Ireland and is evidenced by inscriptions which may go back as far as the 5th century

A.D. This form of Gaelic, also called simply *Irish*, possessed one of the richest literatures of the Middle Ages from the 8th century on. In recent times efforts are being made to revive it as a national language. From the 5th century on Irish emigrants introduced their language into Scotland. Here it took quite an independent development, especially since the Reformation, and was also used as a literary medium. It now goes by the name of *Gaelic*, *Scotch*, or *Erse*. Another form of Gaelic, called *Manx*, is still being spoken by a few hundred people on the Isle of Man.

BALTO-SLAVONIC

Slavonic and *Baltic* are now two different groups, but they parted rather late and still have much in common. Both are very important from a linguistic point of view because of their unusually archaic features, especially as regards declensions and vocabulary. Above all, Lithuanian is most valuable comparative material. Its modern form is hardly different from that of the 16th century and represents a degree of antiquity in many respects equivalent to that of Gothic.

BALTIC

There are three *Baltic languages*:

1. *Old Prussian*, now extinct and only little known from a few documents of the 15th and 16th centuries.

2. *Lithuanian*, the oldest text of which goes back to 1547 A.D. It is still spoken by some two and a half million people in parts of East Prussia and in the former Russian province of Lithuania. As a result of the independence recently achieved by this country, its language has a future as a national tongue. In the United States it is spoken and written by many immigrants.

3. *Lettish* has been known from the 16th century. It also has of late become a national language (Latvia) and is used

by more than a million people living in Kurland and the south of Livonia. It appears in a more advanced stage of development than Lithuanian.

SLAVONIC

The *Slavonic languages* are divided into three large groups:

1. *Southern Slavonic*

For Southern Slavonic we have in the first place a very important although fragmentary document, a translation of the Bible by the brother Saints Cyril and Methodius, who lived in the 9th century and whose home was the country around Saloniki. For purposes of proselytism these two apostles and their disciples translated the Gospel and other religious texts into a language based upon their home dialect. Their work is the oldest record of Slavonic we possess, and its language is sometimes called *Old Slavonic*, although actually it is *Old Bulgarian*. Because it was written for ecclesiastical use, it is also known by the name of *Old Church Slavonic* or *Old Church Bulgarian*. As a religious language it has enjoyed a much greater expansion than it would have if it had been kept out of the Orthodox Church. Many Slavs of non-Bulgarian speech became familiar with it because it was the language of their religious exercises. At the same time, authors from many parts of the Slavonic territory have employed it in the writing of all sorts of religious texts, whose language is therefore studded with dialectal peculiarities according to the authors' mother tongues and the speech varieties used in the local churches. Thus modified it bears the generic name of *Church Slavonic* qualified by the name of the dialect concerned, *Russian Church Slavonic*, *Czechoslovakian Church Slavonic*, etc.

Aside from this ecclesiastical language, Southern Slavonic comprises a very large number of local dialects flowing into each other by innumerable transitional differences from the

Adriatic to the Black Sea. They can be divided into three groups, each being represented by a literary language:

(*a*) *Slovenian*, spoken by more than a million people, known since the 10th century and with a literature dating from the 18th.

(*b*) *Serbo-Croatian*, the language of the Serbs and Croats (about nine million people, chiefly in Yugoslavia), with a literature mainly from the 19th century.

(*c*) *Bulgarian*, current in Bulgaria among more than three million people; it became a national language in the 19th century.

2. *Eastern Slavonic*

In Eastern Slavonic we find three groups which previous to the 12th century were still united. They all are Russian idioms, and their oldest record is from the 11th century.

(*a*) *Little Russian* or *Ruthenian* with various dialects, is spoken by more than 30 million people, distributed over large sections of South Russia (chiefly Ukraine), parts of Bukowina, East Galicia, and North Hungary. It is also used by many immigrants in North America.

(*b*) *White Russian*, so called because it is spoken in the section of Russia which used to be called White Russia (Mogilev, Smolensk, Vitebsk, and Minsk). It exists only in the form of spoken idioms, very much alike, but rather distant from those of the other two groups.

(*c*) *Great Russian* or simply *Russian*, chiefly used in Central and Western Russia. It has given rise to the common and literary language, which is based largely upon the dialect of Moscow but is strongly tinged with Old Church Slavonic elements. Favored by political circumstances, it has conquered huge territories in all directions of both European and Asiatic Russia. As a common language its unification only dates back to the 18th century. It is probably now spoken by more than 100 million people.

3. *Western Slavonic*

The main representatives of Western Slavonic are *Czechoslovakian*, used by some eight or nine million people and with texts from the 13th century, and *Polish*, spoken by about 20 million people, chiefly in Poland but also scattered over parts of Galicia, Posen, Silesia, Prussia, North and South America. Polish has developed quite a rich literature, the first texts of which reach back to the 14th century. Besides, there are a few less important dialects of this group: *Sorbian* or *Wendish*, which is still spoken by a small number of people in East Germany (in Lusatia), and *Polabish*, which was used on the banks of the Elbe but died out in the 18th century. Various other Slavonic dialects extended to Germany but have been absorbed by their more powerful Teuton neighbor.

Germanic

We do not know when and under what circumstances the Indo-Europeans went north and occupied the territory where their language was to acquire the autonomous features characteristic of *Germanic*. In no other Indo-European group has the tendency toward a radically different linguistic type and a new system of articulation been so pronounced as in this. It is probably a compromise between pre-Germanic non-Indo-European and Indo-European idioms. The distinctive Germanic innovations are numerous and have taken many centuries to materialize. The parent Indo-European system of vowels underwent a thorough transformation; the well-known Germanic sound shifting caused an extensive transposition in the various sets of consonants; the free Indo-European accent became attached to the root syllable of the word; peculiar types of declensions and conjugations modified the morphological aspect of pre-Germanic Indo-European; the vocabulary was profoundly altered in its

material make-up and semantic values. These changes came about by degrees according to time and to space, some of them being correlated, some quite independent of the others. But from the large number of common characteristics found in the later evolutionary stages of all the Germanic languages we are induced to think that in the end all these forces of transformation brought about a relatively unified or common language which was spoken for a certain period of time by all the representatives of Germanic speech. This does not imply the existence at any time of any unity of government. The many independent Germanic tribes were simply united by ties of civilization and language and by a general feeling of relationship. Their language, although fundamentally one, was dialectally colored, and a number of corresponding phenomena in its later offshoots are due to original Germanic isoglosses.

PRIMITIVE GERMANIC

This *Parent* or *Primitive Germanic* is entirely prehistorical. Anterior to the Christian era, its process of unification had probably reached its height sometime during the 3d and 2d centuries B.C. We can only gain an idea of its make-up from a hypothetical reconstruction by comparing historically evidenced data. Judging from the oldest runic inscriptions (3d century A.D.) and the Gothic of Ulfilas (4th century A.D.), Parent Germanic must have possessed a great many archaic features. But by reason of the numerous migrations and conquests of the Germanic people throughout their history their language evolved rapidly. The first documentary specimens reveal a linguistic form which is distinguished from common Germanic by many dialectal differentiations. Old Norse is more archaic than Gothic, however, and the runic inscriptions are very important material for the history of Germanic.

Writers of classical antiquity have transmitted a few

Germanic proper names, the oldest illustrations we possess of the language. Some Germanic words borrowed by the Finns, such as *kuningas* (= 'king'), *lammas* (= 'lamb'), etc., are also very old. The first genuine records, however, do not antedate the 3d century A.D. Inscriptions in typically Germanic characters, called the *runic alphabet*, were found especially in Scandinavia and cover a period of approximately five centuries. The oldest consecutive literary text is that of Ulfilas' translation of the Bible in the 4th century A.D. An uninterrupted chain of written texts begins with the 7th century A.D.

Our first knowledge of the existence of Germanic tribes also comes to us through classical writings of the 1st century B.C. Perhaps the name *Germani*, given them by the Celts, meant 'neighbors'; perhaps it was at first applicable only to one particular tribe known to the Celts and was later extended to the entire group. Their original home is uncertain, but the most probable theory locates them in North Germany along the Baltic Sea. In the east they were bordered by Slavs, in the west and south by Celts. From this North German basis they started out on their conquests in various directions and at different times. Some crossed the Baltic and settled in Scandinavia, where they drove the Lapps and Finns northward or imposed their language upon those who remained. Some took a southward and westward direction, thus extending their territory at the expense of the Celts and coming into immediate contact with the Romans. These two migrations took place before the Christian era, although we know little about their accompanying circumstances. From Scandinavia some tribes went back south to settle on the banks of the Vistula, whence they moved again southeast toward the Black Sea. At the beginning of the 3d century A.D. the Goths founded a kingdom between the Lower Danube and the Dnieper. The distribution of Germanic tribes in the 1st century A.D. seems to have been

approximately as follows: the Goths on the Lower Vistula, the Angles and Saxons in Schleswig-Holstein, the Frisians along the coast between the Scheldt and the Weser, and south of the Saxons and the Frisians the other West Germanic tribes which appear later as Saxons, Thuringians, Franconians, Alemanni, Swabians, and Bavarians. Later migrations took the Germanic people into various corners of the world, without their always succeeding in maintaining their language. Several Germanic dialects have entirely disappeared or are known only through sporadic data. This was due, among other circumstances, to the fact that the conquered people possessed a higher cultural power and also to the lack of Germanic political unity. The Ostrogoths founded a short-lived kingdom in North Italy which ended in 555 A.D.; the Visigoths penetrated into Spain and established another kingdom there which lasted until 711. Scandinavians occupied parts of Russia and of France (Normandy). West Germanic tribes crossed the Rhine and settled in northern and northeastern France and in Belgium. But in all these cases they abandoned their own language to adopt that of the conquered peoples. Only in the northern half of Belgium did the power of Roman culture and language fail to be more effective than that of the occupying Franconian tribes. To this day a line which runs from Dunkirk (France) to Aachen (Germany) has formed the boundary between Romance and Germanic speech. At repeated intervals in the 5th and 6th centuries other very important migrations took place; several tribes left Northwest Germany for the eastern and southern districts of Britain. Their language met with greater success in its competition with the prevailing forms of insular Celtic.

From the time written documents of the different Germanic languages appear, there is conclusive evidence of three distinct groups having developed—*North*, *East*, and *West Germanic*. About the time and the circumstances of these

developments we know very little, but the migrations above described roughly correspond to this tripartite formation. Each of these three groups has, besides its own decidedly characteristic idiosyncrasies, certain things in common with each of the other two, the greatest distance occurring between North and West Germanic. That the East and North groups have many more features in common some linguists consider to be due to their having at one time been one and the same group, separated as a whole from West Germanic.

NORTH GERMANIC OR SCANDINAVIAN

As we have seen, the oldest Germanic records, the runic inscriptions, are in Scandinavian and cover the period from the 3d century to the 8th. The form of their language, often called *Old Norse* or *Old Scandinavian*, does not seem to have lost its relative unity during that period. After the 8th century, however, various dialectal groups begin to emerge, and from the 11th century down we distinguish two different branches of North Germanic, *West Scandinavian*, comprising *Icelandic* and *Norwegian*, and *East Scandinavian*, comprising *Swedish* and *Danish*.

Icelandic and *Norwegian* were originally identical, but when in the course of the 9th century the Norwegians occupied Iceland, their language, favored by its geographical isolation, soon started an independent and autonomous growth. In the Middle Ages Icelandic literature flourished, and it was particularly rich and productive from 1200 to 1350. The songs of the *Edda* are important monuments of world literature. The peaceful inhabitants of this island have never ceased to show a keen interest in literary activities.

The *Norwegian* of Norway has had a less glorious history, especially since the Middle Ages. In 1397 Norway was politically united to Denmark, and its language was then gradually superseded by Danish for all official and literary uses. From that time until the beginning of the 19th cen-

tury the history of Norwegian is merely one of spoken dialects. In 1814, the year of the separation of Norway from Denmark, a new era began for the Norwegian language. Although a form of Danish with Norwegian peculiarities ("rigsmaal") was adopted as the official and literary language of the country, continuous forces have been at work to develop a national tongue based upon various autochthonous dialects ("landsmaal"). Today Norwegian has regained its dignity as a literary language.

Swedish and *Danish* have enjoyed an uninterrupted development ever since the 14th century, both as literary and as common national languages. Both of them have undergone the influence of Low and High German to a considerable degree.

The Scandinavian languages are remarkable for their advanced state of deflection.

EAST GERMANIC

Several East Germanic dialects have left no trace; of those spoken by the Burgundians and the Vandals we possess only a few proper names. The one representative of this group with fairly extensive records is *Gothic*. The kingdom established by the Goths in the Balkans in the 3d century was divided into that of the Ostrogoths and that of the Visigoths. We have seen how the language of the former was absorbed by the dialects of Northern Italy during the reigns of Alaric and Theodoric, that of the latter by the dialects spoken in Spain at the time of the Visigoths' domination of that country. Their language, which seems to have been essentially one and the same during the 4th and 5th centuries, has been preserved in the fragmentary translation of the Bible by the Arian bishop Ulfilas, himself a Visigoth, who lived from about 310 to about 383, and in a few other religious texts. The Gothic language of the Balkans died out early. In addition to some short Gothic texts of Italian origin, we

also possess a list of a few words representing a form of Gothic spoken in the Crimea. They were collected there in the 16th century from the mouths of the people by a Flemish ambassador of Charles V to Turkey. Crimean Gothic has since died out completely.

WEST GERMANIC

Because of lack of records it is impossible to know exactly what common West Germanic was like. From comparison of its later representatives it seems quite probable that it contained a good number of dialectal differences. From the time of the first texts we distinguish the following groups:

Anglo-Frisian

English.—The Angles, Saxons, Jutes, and perhaps Frisians who left their continental Germanic home for Britain during the 5th and 6th centuries[18] imposed their language on the British Celts or drove them into mountainous districts where some of them have since found a shelter. The imported dialects, although related, were by no means identical. We find them in the form of three distinguishable groups which were distributed over the English territory as follows: *Anglian* in the northern and central districts (Northumbria and Mercia), *Saxon* in the South (Sussex and Wessex), and *Kentish* in the Southeast (Kent). Separated from the European mainland, their history became quite independent of that of their continental relatives. In the form in which they were used in England from about 450 to about the 12th century we call them by the name of *Anglo-Saxon* or *Old English,* both collective terms comprising all the then existing dialectal varieties. The first Anglo-Saxon records are glosses, some of which may be from the 7th century. The

[18] *Cf.* Rudolf Thurneysen, "Wann sind die Germanen nach England gekommen?" *Englische Studien,* Bd. XXII, pp. 163*ff.*

oldest literary works (Caedmon's, Cynewulf's, *Beowulf*, etc.) go back to the 7th and 8th centuries.

It is impossible to appraise exactly the influence of the previous Celtic dialects on those of the Anglo-Saxon invaders, especially in so far as the phonetic compromise between the two heterogeneous mechanisms of articulation is concerned. From the point of view of vocabulary, Celtic infiltrations seem to have been almost infinitesimal. The Christianization of the country which began about 600 A.D. left a much more lasting impression on the language. Many Latin words relating to scholastic and religious matters found their way into it. Later, at the end of the 8th century, Danes and Norwegians invaded England and mixed with its population. This, too, left a marked imprint on the Anglo-Saxon language, especially on the northern and central dialects. A still greater influence was exerted on the development of the language by the conquest of England by William the Conqueror (1066) and the French-Norman régime which followed. French became the official language of the court and of the aristocracy; it was used for legislation, in judicial matters, and, for a time at least, in the schools. Anglo-Saxon continued to be spoken by the people, but it was continually exposed to the penetration of French elements into its vocabulary as well as its phonetic and structural system. Its characteristics as a Germanic language, however, were not destroyed, as can be seen from the conjugational system, the more resisting part of the vocabulary, and, above all, the Germanic accent. In the 13th century the French influence began to decrease, and at the beginning of the 15th English was again the official language of the court.

The *Middle English* period extends from about the end of the 11th century to the 16th. A growing tendency toward the unification of the language set in about the middle of the 14th century, chiefly radiating from London as a center and eventually resulting in common English. Its constituents

were supplied by the London dialect, blended with numerous ingredients from the neighboring idioms of Central England. This common English conquered practically the whole country and eventually extended to Scotland and Ireland, with the exception of the districts of insular Celtic previously described. In due time it was used for all national and literary purposes, while the other varieties of English were left to the vicissitudes of local dialects.

One of the outstanding peculiarities of *Modern English* (from about 1500 to the present time) is the highly simplified and analytic character of its morphology and syntax, which causes it to be almost an isolating language of the same type as Chinese. Owing to its grammatical simplicity, to its international vocabulary, and especially to happy circumstances in the national history of Great Britain, the English language has extended to many parts of the world and has become the international language of business and commerce. Probably more than 200 million people speak it today. This enormous expansion has naturally given rise to more or less far-reaching differentiations in different parts of the English-speaking world—British, American, Australian, Canadian English. In several instances English used by people of an entirely different linguistic type results in a mixed or creolized language, the best known example being the so-called *pidgin English* of the Far East, a kind of Chinese with English vocabulary.

Frisian.—Frisian is the continental European dialect that has the most points of contact with English. *East Frisian* is more closely related to Northumbrian, *West Frisian* to Kentish. The Frisians, the Angles, and the Jutes probably formed a more or less coherent group among the West Germanic tribes, and their dialects may be joined together under the generic name of *Anglo-Frisian.* In the Middle Ages Frisian was spoken in a comparatively large region of Northwest Germany and in the provinces along the coast of the

Netherlands. Its territory has been considerably reduced owing to the expansion of Dutch and of Low German. Today *West Frisian* is being spoken in the Dutch province of Friesland and the adjoining islands, *East Frisian* in the German region of Oldenburg, and *North Frisian* on the west coast of Schleswig and the insular neighborhood. The oldest literary sources date from the 13th century. The Frisians of Holland have at various times tried to raise their dialect to the dignity of a literary language.

German

From the group of German dialects two distinct national tongues have emerged in the course of time, *German* and *Dutch*, each with a brilliant literary tradition of its own. Taken as a whole, the German dialects are divided into two large groups according to whether they have been affected or not by the shifting of the Germanic system of consonants known as the second or High German sound shifting. The dialects that have remained entirely free from the action of these consonantal laws are called *Low German*, because they occupy the lower or northern parts of Germany. The others are located in the mountainous regions of the South and are, therefore, termed *High German*. Among the latter those of the most southerly districts have altered the consonants in question with very consistent regularity: they are the *Bavarian* dialects, spoken in Bavaria, Austria, Styria, parts of Tyrol, and Carinthia, and the *Alemanic* ones used in Switzerland, Baden, Alsace, and Württemberg. Together they go by the name of *Upper German*, as opposed to that group of High German varieties in which the consonantal changes have only partly penetrated. The so-called *Middle German* dialects comprise the following subdivisions: *Thuringian* in Thuringia; *Upper Franconian*, with the *East Franconian* branch in the districts around Würzburg and Bamberg and the *Rhenish Franconian* branch

around the cities of Mainz, Frankfort-on-the-Main, Worms, Speyer, and Weissenburg; *Middle Franconian*, with its ramification into *Moselle Franconian* around Trier and *Ripuarian* around Cologne. *Low German* stretches all the way north of a line connecting Dunkirk in France and Königsberg in East Prussia. It embraces all the *Saxon* and *Low Franconian* idioms. But since the latter have developed the national language of the Netherlands, the term Low German is now restricted chiefly to its Saxon varieties, which are also known as *Plattdeutsch*. The boundary between the two runs in a southward direction from the shores of the Zuyderzee (Harderwijk) to Aachen.

High German.—The essential facts of the High German sound shifting are the following: (1) Germanic *p*, *t*, and *k*, when occurring between vowels or at the end of a word after a vowel, become *f* (*ff*), *s* (*ss*), *hh* (*ch*). For example, Goth. *lētan* corresponds to H.G. *lassen* and to Engl. *let*; Goth. *slēpan* corresponds to H.G. *schlafen* and to Engl. *sleep*; West Germanic *taikan* corresponds to H.G. *Zeichen* and to Engl. *token*. (2) At the beginning of a word or after a consonant, or when geminated, Germanic *t* becomes *ts* (spelt *z*), *p* often becomes *pf*, and *k* sometimes becomes (*k*)*ch*. For example, Goth. *taíhun* = H.G. *zehn* = Engl. *ten*; Goth. *tunþus* corresponds to H.G. *Zahn* and to Engl. *tooth*; Goth. *kniu* is represented by O.H.G. *chniu* and Engl. *knee*. As may be seen from these few examples, the English words have preserved the Germanic habit in regard to the consonants in question. Not only did the Anglo-Saxons leave the continent before the action of the High German sound shifting set in, but even if they had still been in Germany, their dialects, being of the Low German type, would not have been affected.

At the beginning of the 8th century, when the first High German records appear, the changes described were virtually completed, so that the distinction between High and Low German was then already an accomplished fact. The form

of High German used from these early beginnings to about 1100 is generally called *Old High German.* It was not one language but a collection of dialects of varying importance. One of its characteristics is that full vowels were to a large extent preserved in flectional endings. The declension of the Old High German noun *gëba* (= 'gift') was: Singular, Nom. *gëba*, Gen. *gëba* (*gëbu, -o*), Dat. *gëbu, -o*, Accus. *gëba*; Plural, Nom., Accus. *gëba*, Gen. *gëbôno* (*gëbôn*), Dat. *gëbôm* (*-ôn, -on*).

From the beginning of the 11th century to about 1550 the form of the language is called *Middle High German*, which also is a mere collective name for different dialectal varieties. In the literature of this period, however, a tendency toward uniformity of the language is clearly noticeable. In Middle High German all full vowels of the endings are weakened to indefinite *e*, so that the declension of the above-given noun has now become: Singular throughout, *gëbe*; Plural, Nom. and Accus. *gëbe*, Gen. and Dat. *gëben*. Another characteristic phenomenon of this period is the spreading over large districts of the umlaut,[19] a palatalization of certain vowels, especially *a*, under the influence of others, especially *i* or *j*.

The *Modern High German* period is characterized chiefly by the development of a common language. This was brought about by a concurrence of many favorable circumstances, such as the use of the vernacular instead of Latin by the German chanceries and Protestant churches, the growing influence of printing, Luther's translation of the Bible. The stamina of this common High German consists of Middle German (Upper Franconian) with Upper German ingredients. It did not conquer the domains of the other dialects at once. At the beginning of the 17th century it had eliminated Low German as a possible language of the educated classes and of literature. The rivalry with the dialects in South Germany, Switzerland, and particularly

[19] *Cf.* page 232.

Austria lasted much longer, partly because the South remained Catholic and consequently did not use the vernacular of Luther's Bible translation in the churches. But even elsewhere the unification was far from being complete; it took a long period of systematic preaching and the combined action of many forces before a more or less unified type of German was generally accepted. Nothing less than the powerful influence of the literature of the classical period was required to put an end to the tenacity of German dialectal tendencies.

Modern High German is now spoken by about 80 million people. Outside of Germany and the overlapping German-speaking districts of neighboring countries, such as Poland, Czechoslovakia, Austria, Switzerland, France, Belgium, and Holland, it is the language of many settlements in Hungary, Rumania, Russia, North and South America.

Judaeo-German or Yiddish.—The Jews of Germany, called *Ashkenazim* as opposed to the Spanish *Sephardim*, have since the 14th century developed a special language known by the name of *Judaeo-German* or *Yiddish*. It is based upon some Middle German dialect or mixture of dialects blended with Hebrew, Slavonic, and other exotic elements. It is hardly used in Germany any more, because the influence of prominent Jews and their remarkable contributions to German literature have succeeded in substituting German for Yiddish among their brethren. But those who emigrated from their home country to the eastern parts of Europe at the time of the Jewish persecutions have kept their language alive, so that Yiddish is now spoken by many Jewish communities from the Baltic to the Black Sea. Of these, many emigrated later to America, where Yiddish enjoys quite a prosperous life. A less important variety of Yiddish is still spoken in Alsace and by a few communities in Lorraine.

Low German.—The oldest Low German text is a long religious poem, entitled *Heliand* (= 'Savior'), from the first

half of the 9th century. In this old form Low German is usually called *Old Saxon.* In the course of centuries Low German has extended to large districts at the cost of Frisian, Danish, and especially of Slavonic idioms in the east. Since it was superseded by High German as the written and common language, it survived merely in the form of a great many local patois. A more or less artificial renaissance set in in the 19th century, when a number of talented artists began to use it as the vehicle of their literary expression.

Dutch

The different dialects spoken in the territory of the Low Countries (Holland and the northwestern half of Belgium) are: *Frisian* in Frisia, *Saxon* in the East, and *West Low Franconian* in the South and West. Because of various circumstances no records of the *Old Dutch* period have been transmitted. We possess, it is true, a translation of some twenty-five psalms from the 10th century through which a form of *Old Low Franconian* has been handed down. But its dialect is East Low Franconian, very similar to but by no means identical with the West Low Franconian variety which constitutes the foundation of the Dutch language. When the first documents in a West dialect appear at the end of the 12th century, the language had entered upon its middle period of development, which lasted until about 1550. During those centuries the cultural and economic centers were situated in Flanders, and consequently *Middle Dutch* is mainly represented by *Flemish* or South Dutch texts. Although a trend toward a certain uniformity is manifestly present during this period, the term Middle Dutch designates a collection of different dialects.

From about the middle of the 16th century the language is called *Modern Dutch.* As a consequence of the religious and political events in the Low Countries of the 16th and 17th centuries, the cultural and economic prosperity moved

from the Flemish cities to northern centers such as Amsterdam, The Hague, Haarlem, Leyden. The result was that the dialect of the province of Holland became more important than the others. Favored by the use of the vernacular in official texts and the Reformed churches, the translation of the Bible (1625 to 1637), and the extraordinary development of 16th-century literature, the dialect of Holland gradually became *the* Dutch language, at first written and later spoken by all educated Dutchmen. The other dialects continued to be used for domestic purposes. Conditions prevailing in Belgium have made it very difficult for standard Dutch to take root south of the political border line. But today it may be said that Holland and Flanders have essentially the same common language.

Outside of Europe, Dutch is being spoken in a modified form in South Africa by the Boers, in the Dutch East and West Indies, and in various settlements of the United States. In several instances it exists in a contaminated form as a mixed or creolized language.

CHAPTER XI

THE NON-INDO-EUROPEAN LANGUAGES [1]

Asianic Languages

Some very ancient languages of Western Asia have left monuments, gradually increasing in number as a result of the progress of excavations, whose inscriptions are little by little being deciphered. On the basis of the data hitherto available it is possible to divine more or less clearly that some of these languages were interrelated or akin to other linguistic groups already known (for example, Indo-European, Caucasian, etc.), while others have revealed nothing or hardly anything of their genealogical membership. The difficulty of their study is not merely one of epigraphical deciphering, but of structural and genealogical appraisal, because of the relative scarceness and recent interpretation of their documents, as well as the lack of historical information about the periods concerned. C. Autran arranges them according to geographical distibution in the following three groups: (1) those of the Lower Euphrates and Tigris; (2) those of Asia Minor and the mountainous regions of Mesopotamia; and (3) those of the Mediterranean. But other groupings have been suggested on the basis of various theories of relationship. [2]

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[1] For a detailed bibliography concerning the several non-Indo-European languages and linguistic families the reader is referred to the two standard works, P. W. Schmidt, *Die Sprachfamilien und Sprachenkreise der Erde*, and Antoine Meillet and Marcel Cohen, *Les langues du monde*. In the former the bibliography is presented in such a way as to reflect at the same time the history of our growing knowledge of each linguistic group.

[2] *Cf.* Meillet and Cohen, *op. cit.*, p. 274; Schmidt, *op. cit.*, pp. 64*ff.*

SUMERIAN

The first group consists of *Sumerian*, the non-Semitic language of which at the present time we possess the oldest inscriptions (about 4000 B.C.). It was probably spoken more than 5,000 years before our era on the banks of the Lower Euphrates, from Babylon to the Persian Gulf. Itself influenced by Semitic, it left its imprint on the language of the Semites who later occupied its territory. A rich literary production extends over approximately 2,000 years, and even when Sumerian was being replaced as a spoken language by Akkadian, it was maintained as a written and religious language until about 300 B.C. There are two varieties of Sumerian, which seem to represent successive differentiations rather than simultaneous ones. Only contradicting hypotheses exist as to its genealogical membership.[3]

ASIA MINOR AND MESOPOTAMIA

To the second group belong (*a*) *Mitannian*, along the Upper Euphrates, of which only proper names and one epistolary text are extant and which is perhaps related to the South Caucasian dialects as well as to (*b*) *Cossean* and (*c*) *Vannic*. Of Cossean, situated east of the Zagros Mountains, hardly anything beyond a few isolated words or proper names has been found, and Vannic, around the Lake of Van, has left only a few inscriptions from the 9th and 8th centuries B.C. (*d*) *Elamite*, south of the Zagros Mountains, with inscriptions from about 2600 B.C., is better known, but none the less genealogically isolated. The group of (*e*) the *Hittite-Cappadocian* languages, located in Cappadocia, south of the Black Sea, has handed down a considerable number of cuneiform tablets with vocabularies and continuous texts. The study of *Hittite* has revealed phonetic and lexical resemblances with

[3] *Cf.* Schmidt, *op. cit.*, p. 77.

Semitic, Sumerian, Mitannian, Elamite, Caucasian, Etruscan, and Indo-European. From a morphological point of view it has a marked Indo-European physiognomy. Its genealogical affinity has not yet been finally determined, but it seems to be somehow related to some ten other languages of Western Asia Minor, such as *Cilician*, *Carian*, *Lycian*, *Lydian*, etc., all of which are only little known.

MEDITERRANEAN

The third group comprises what are perhaps a few Mediterranean remnants of original Asianic languages, among which the most important and best known is *Etruscan*, in Italy. It originally extended west of the Apennines, approximately from Florence to Rome. Later expansion carried it much beyond this territory in all directions. Its relationship to the languages of coastal Asia Minor is considered quite certain, although the degree and character of this relationship remain still doubtful. Various other languages, perhaps allied to Etruscan, were scattered on the islands of the Mediterranean, for instance, Cyprus, Crete, and Lemnos.[4]

HAMITO-SEMITIC

The languages grouped under the heading of *Hamito-Semitic* have a number of features in common, especially phonetic and morphological, which point to a possible relationship and common ancestry. However, the evidential material available is far from being of a compelling nature. In the phonetic field the general variety and stability of the consonants and the abundance of glottal and laryngeal consonants are quite typical, whereas labials are rather scarce. As the name indicates, there are two groups, comprising the *Hamitic* (< Ham, Noah's second son) and the *Semitic*

[4] *Cf. ibid.*, pp. 64*ff.*

(< Sem, Noah's eldest son) languages. The latter are more evidently interrelated, the former seem much farther removed from one another.[5] On the whole they are spoken by people of the white race occupying the whole width of the North African continent and important sections of Western Asia. Efforts to establish their relationship with Indo-European on the one hand and with the Bantu dialects of Central Africa on the other have as yet yielded little more than bold guesses.[6] The territories occupied by Hamito-Semitic have changed little since these languages appeared in history, although their relative distribution and importance have been subjected to a great many shifts in the course of time.

SEMITIC

Marcel Cohen divides Semitic according to certain common features into *East Semitic* and *West Semitic*, and the latter into a *Northwestern* and a *Southwestern* group.[7] A peculiar feature they all share in varying degrees is the so-called triliterality, that is, the basic referential aspect of their words is usually symbolized by a radical of three consonants which remain more or less constant throughout a whole set of related forms and words. Thus, the consonantal radical $\sqrt{qtl}$ symbolizes the fundamental reference to the action of killing, while the insertion of various vowels results in corresponding incremental modifications of this fundamental reference.

East Semitic

The only *East Semitic* language known is *Akkadian*, which was spoken in Ancient Babylonia and Assyria and is therefore sometimes called *Assyro-Babylonian*. Its history is

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[5] *Cf. ibid.*, pp. 61, 62.
[6] *Cf. ibid.*, pp. 63, 80, 83, 84.
[7] *Cf.* Meillet and Cohen, *op. cit.*, pp. 91*ff.*

traced back to about 3800 or 3600 B.C.; but after the fall of Babylon (526 B.C.) it was displaced by Aramean, although it survived as a religious language until the beginning of the Christian era.

Northwestern Semitic

The two *Northwestern Semitic* units are *Canaanitic* and *Aramean*, the first of which comprises *Phenician* and *Hebrew*. In addition, a form of *Old Canaanitic* is known from a few cuneiform inscriptions dating from about 1400 B.C.

Phenician.—Phenician occupied the coastal Mediterranean region of Asia and was carried across to Carthage and surrounding countries in North Africa. It has been transmitted through inscriptions which go back as far as the 9th century B.C., but it is little known because of the complete lack of vowels in its transcriptions. In Asia it was entirely submerged by Aramean in the 1st century B.C., while in Carthage it was preserved at least until the 4th century A.D. Colonial Phenician is also known by the name of *Punic*.

Hebrew.—Hebrew was spoken in Palestine and has come to us chiefly through the Old Testament of the Bible, the oldest document of which is said to be anterior to 1000 B.C. In the middle of the 5th century B.C. the old texts were completed, arranged, and amalgamated, but the use of Hebrew as a spoken language began to decline. As early as the 3d century B.C. Biblical Hebrew is distinguished from post-Biblical or *Mishnaic Hebrew* used in the compilation of the *Mishna* (='doctrine'), a juridico-religious code of the orthodox Jews dating from the first two centuries A.D. From the Middle Ages to our times a Hebrew mixed with Aramean has been used and taught by the rabbis very much in the same way as Scholastic Latin by the Catholics (*Neo-Hebrew*). Today the Zionist movement in and outside of Palestine tends to resuscitate Hebrew as a spoken language. In the 6th and 7th centuries A.D. an attempt was made to supply the necessary

vowels to the texts of the Bible by the so-called Masoretes (*māsōreth* = 'tradition'). However, the product of these efforts cannot be considered as authoritative for the actual old vocalization.

Aramean.—Aramean existed in the form of many dialects east of Akkadian and encircling both Hebrew and Phenician. Its chief expansion took place in the period from 300 to 650 A.D., during which it replaced Akkadian, Phenician, and Hebrew. Today the so-called *Neo-Aramean*, also known as *Neo-Syriac*, is spoken by only about 200,000 people, while Arabic has taken its place.

Southwestern Semitic

Arabic.—*Southwest Semitic* comprises the various forms of *Arabic*. From North Arabia we have a certain number of inscriptions dating from the 2d or 1st century B.C. and revealing a language, called *Lihyanite*, closely related to Arabic proper. The latter was located in Central Arabia, and its earliest records in the form of inscriptions do not antedate the 4th century A.D. At the same time, however, a literary Arabic, not yet written, prospered, which is known as the Arabic of ante-Islamic poetry. It is in this language, mixed with dialectal elements from the city of Mecca, that the *Koran*, the collection of Mohammedan preachings, was written in the 7th century A.D. The language of the *Koran*, literary, learned, classical, was not spoken by the multitude, but it became one of the most important written languages in history. Its literature is extremely rich and varied. Its language is a more or less artificial, unified, coherent system, with many subtle intricacies of morphology and syntax. As a written language it has not been replaced in modern times, and it is still the vehicle used by the Arabic press of today. Moreover, the *Koran* with its language has traveled wherever the Mohammedans went on their errands of invasion. About the spoken dialects of Central Arabia at the

time of Mohammed very little is known. Those which are spoken today in Asia and Africa by some 30 million people are not sufficiently differentiated to prevent a mutual understanding. Modern spoken Arabic is very simple and analytic from a grammatical point of view. *South Arabic,* closely related to Arabic proper, is known by inscriptions from the 8th to the 6th century B.C. There is no other South Arabic literature extant. Today it is in use only in a few districts of Southeastern Arabia.

Ethiopic.—Ethiopic is the Semitic spoken in Abyssinia, whither it was introduced from South Arabia long before the Arabic expansion. It is a compromise of South Arabic and Hamitic dialects. *Geez,* one of the archaic dialects, subsists today as the liturgical language of the Abyssinian Christians. Of the several dialects current in our time, *Amharic* is by far the most important. It has been written since the 13th century A.D. and is used as the official and court language.[8]

HAMITIC

Among the *Hamitic* languages, *Egyptian* has been well known since about 4000 B.C. In the 7th century A.D. it was still very much alive. Its history is closely connected with that of hieroglyphic writing and is most important from the point of view of ancient civilization. *Coptic* is the name for the various popular Egyptian dialects into which the New Testament was translated from the 3d century A.D. on. It ceased to be spoken about the 16th century A.D. but is still the liturgical language of the Coptic church.

Of the other Hamitic languages comparatively little is scientifically known. In North Africa, between Egypt and the Atlantic, *Libyan* and *Berber* dialects are spoken in more

[8] Among the Semitic languages mentioned here, Akkadian and Ethiopic are representatives of an older, more archaic layer. *Cf.* Schmidt, *op. cit.*, p. 62.

or less scattered districts. The most compact groups are situated between Tripoli and Algiers and on the African littoral just opposite the Canary Islands. Elsewhere they are rather scarce because Arabic has absorbed them. Only a few old inscriptions and a few modern religious texts have been transmitted. Before the Arabization in the 7th and following centuries Lybian and Berber were spoken all over the North of Africa as far as Egypt, while Punic and Latin were the written languages in Libyco-Berber territory.

Cushitic (< Cush, the eldest son of Ham) is the Hamitic group of dialects of the eastern corner of Africa, both south and north of Ethiopic. They are spoken by some six million people but have no written literature. What is known of them we owe to late 19th century scholars. The most important dialects are *Bedja*, *Saho* and *Afar*, *Somali*, *Galla*, *Agaw*, and *Sidama*.

Finno-Ugric and Samoyedic

Until not long ago the *Finno-Ugric*, or *Uralian*, and the *Samoyedic* languages were considered a branch of a larger group called *Ural-Altaic* (Ural = the mountain range between European and Asiatic Russia; Altai = a mountain range of Central Asia) or *Turanian*[9] (Tur = one of the three brothers from whom, according to Persian legend, sprang the races of mankind). According to that classification, Samoyedic is considered as a transitional language, and the Altaic group consists of the Turkic, Mongolic, and Tungusic languages. A. Sauvageot and Jean Deny, however, believe that because of lack of evidence as to their relationship these two branches cannot be grouped together.[10] But both Samoyedic and Finno-Ugric descend from a common Uralian language with

[9] This term was introduced by Max Müller.

[10] *Cf.* Meillet and Cohen, *op. cit.*, pp. 154, 185; Schmidt, *op. cit.*, pp. 51*f.*, 54.

which also *Eskimo-Aleutian* appears to be related.[11] It is assumed that its original situation was at the foot of the Ural Mountains. Moreover, there appears to have existed a *Primitive Finno-Ugric* and a *Primitive Samoyedic* language. This is inferred from a comparison of the morphological and lexical material of the various dialects of each of these groups.

FINNO-UGRIC

Common Finno-Ugric was probably spoken on the banks of the Middle Volga, because certain very ancient loans point to the fact that it was adjacent to Indo-European territory. Various migrations, of which little is known, resulted in the dislocation and diversification of the original unit into distinct languages or dialects. These are: *Finnish* and its immediate relatives *Carelian, Olonetsian, Vepse, Vote, Esthonian, Livonian; Lapp; Mordvinian; Cheremissian; Permian*, with its two varieties *Zyrian* and *Votyak; Vogul; Ostiak;* and *Magyar* or *Hungarian. Finnish* proper is spoken by some three million people in Finland, the North of Sweden and various settlements in Norway and the United States; *Carelian, Vepse,* and *Vote* are the dialects of a few thousand people in the Russian districts bordering on Finland; *Esthonian* is the language of Esthonia on the Baltic (about one and a half millions), *Livonian* that of a few villages of Livonia, also on the shores of the Baltic. Apparently the Lapps occupy a unique place in the group, inasmuch as at the origin they perhaps did not form part and parcel of the primitive Finno-Ugric family. Possibly they are the oldest inhabitants of Scandinavia and Finland. The language they speak today, *Lapp*, is manifestly Finno-Ugric but may have been adopted by them very early for reasons unknown. Lapp is used by some thirty thousand people scattered over northern

[11] *Cf.* Schmidt, *op. cit.*, pp. 52*ff*.

Norwegian, Swedish, Finnish, and Russian territories. *Mordvinian* (about one million) and *Cheremissian* (about 300,000) still occupy the original Finno-Ugric districts of the Middle Volga; *Zyrian* (about 250,000) is located west of the Ural Mountains about the headwaters of the Pechora and Dvina Rivers; *Votyak* (about 400,000) is situated between the Viatka and the Kama; *Vogul*, nearly extinct, is found east of Zyrian, beyond the Ural Mountains; *Ostiak*[12] extends along the banks of the Ob River, north and east of Vogul. *Magyar* or *Hungarian*, the language of some nine million people in Hungary and some parts of the adjoining countries, is more closely related to Ostiak and Vogul. It has transmitted the oldest documents of Finno-Ugric, dating from the 13th and 14th centuries A.D.

Of all the Finno-Ugric languages, only four have been used for literary purposes. Esthonian has had a literature since the 17th century, when the New Testament was translated into the vernacular. In Finnish, isolated words are known from the 12th century, but the language began to be written more widely in the 16th century. Not until the 19th century, however, did it acquire the degree of perfection necessary for the expression of all the wealth and subtleties of modern civilization. The literature of the Lapps consists of sacred texts and a few chronicles written in various dialects. Finally, Hungarian has developed a very rich and varied literature, especially since the 18th century.

The Finno-Ugric linguistic type was originally quite different from that of Indo-European. But as early as the period of Finno-Ugric unity it was submitted to Indo-Iranian influence. Later the Finnic languages were affected by Slavonic and Germanic, especially Swedish and German; Hungarian was influenced by Turkish, Slavonic, Italian, German. In the 19th century the Germanic influence upon

[12] The Yenisei-Ostiak variety is believed to be related to Tibeto-Chinese. *Cf.* Schmidt, *op. cit.*, p. 134.

Magyar, Esthonian, and Finnish became so great that the whole structural aspect of these languages was gradually molded after that of their more powerful neighbors. Not only is their vocabulary extremely mixed, but their morphology and syntax have been modified to a more or less considerable extent.

Among the characteristic features of Finno-Ugric, vocalic harmony is often mentioned as particularly outstanding. As a matter of fact, this phenomenon is found in only a certain number of the languages concerned, and even there it is carried through with varying degrees of consistency. Moreover, instead of being a primitive peculiarity, it seems to have developed in the course of time as a secondary feature. On the other hand, it may be interesting to note that the languages of this family ignore grammatical gender.

SAMOYEDIC

Samoyedic dialects are spoken by some eighteen thousand people spread over huge territories north and east of the Ostiaks, from the northern end of the Ural Mountains to the Yenissei River and beyond.

TURKIC, MONGOLIC, AND TUNGUSIC

Turkic, *Mongolic*, and *Tungusic* are sometimes collectively classified as forming the *Altaic* group.[13] They possess a considerable number of common features, which belong mostly to their phonetic system, their syllabic word structure, their lexical material, and their syntax, but not to their morphology. Vocalic harmony is found in all their dialects, although in varying degrees; grammatical gender is ignored; suffixes are extremely numerous, to the exclusion of pre- and infixes. In spite of the many striking resemblances, how-

[13] *Cf.* page 404.

ever, their genealogical relationship has not yet been satisfactorily established, because the majority of their common characteristics might also be accounted for by causes other than common origin, such as linguistic mixture or parallel development. On the other hand, we have seen that it is no longer commonly admitted that they belong to the same family as the Finno-Ugric languages. Their origin is obscure, as is that of the people who speak them. In spite of the enormous area they occupy, the various dialects of each of the three groups are very little differentiated. Generally speaking, a scientific classifying of these dialects is as yet impossible for lack of sufficient information. Such classifications as are traditionally given are geographical rather than genealogical or structural.

TURKIC

Turkic comprises some twenty-eight such dialects[14] extending over vast areas in Europe and Asia. In Europe they are spoken not only in Turkey and sections of the adjoining countries, but also in the Crimea, on the shores of the Caspian Sea, on the banks of the Volga and the Kama, etc.; in Asia they stretch, with interruptions, from Asia Minor to and including Chinese Turkestan, the boundaries being roughly formed in the south by Persia, Afghanistan, and Tibet and in the north by a line running from Tobolsk north of Tomsk to the Yenisei River. West of this river stretches the territory of the Tungusic languages, but to the north of these, in Siberia, lies the domain of *Yakut*, another Turkic dialect. The number of people of Turkic tongue probably does not exceed 39 million, which, compared to their tremendous geographical distribution, gives an idea of their inconsiderable density. *Ottoman* or *Osmanli*, which is often referred to as

[14] Schmidt enumerates twenty of them, *op. cit.*, p. 55.

Turkish proper, is the language spoken in European and Asiatic Turkey. Of all the dialectal varieties only two differ considerably from the others, namely, that of the Yakuts and the one called *Chuvash*,[15] spoken around the junction of the Volga and Kama rivers. The earliest records are runiform inscriptions dating from 734 or 735 A.D. Other documentary sources show that the dialectal distribution has remained practically the same ever since the 11th century. Aside from a certain number of early religious texts, Turkish literature does not appear in history until the 14th century. Up to about 1850 it was chiefly influenced by Arabic and Persian, but later European influences prevailed.

MONGOLIC

In the 13th century A.D. the triumphant armies of the Mongolian emperor Jenghiz Khan and his successors succeeded in subjugating a large portion of the world to their rule. Of the previous history of these Asiatic tribes little is known with certainty, and even their military and political conquests of the 13th century were only ephemeral. Outside of Mongolia itself their influence soon vanished, and their language was again confined to the country from which they came. The only linguistic deposits that have survived elsewhere are found in comparatively small sections on the banks of the Volga north of the Caspian Sea and in the North of Afghanistan. The total number of people speaking *Mongolic* dialects today is estimated at three million. These dialects, geographically grouped, resemble each other more than do those of the Turkic family. The oldest documents known are inscriptions from the 13th century. The subsequent literature consists mainly of historical, religious, and other didactic texts of little originality.

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[15] *Cf. ibid.*, p. 51.

TUNGUSIC

Equally uncertain is the origin of the *Tungusic* and *Manchu* tribes and languages. Today they occupy the section of Asia that extends from the Yenisei River to the Sea of Okhotsk, between Mongolia and Yakut Siberia. The people of Tungusic tongue are probably less than one million. Their language is destined to early extinction by reason of the constant encroachment of Chinese. However, from the 17th century on Manchu was codified, developed, and preserved as a written language in translations, grammars, and enormous dictionaries. The British Museum possesses a unique manuscript of a Manchu dictionary in five languages and thirty-six volumes. These documents are of great linguistic importance, although they represent a language which was artificially revived and soon became dead. The geographical distribution reveals a number of Tungusic dialects, of which Manchu is the most important.

JAPANESE

Notwithstanding the great number of books dealing with the *Japanese* language, the available data are considered insufficient to allow of its being adequately classified. Its closest relative seems to be Korean, but a number of linguists consider it related to Ural-Altaic. As far as the writing system is concerned, it has always been intimately linked with Chinese. Its literature is rich and goes back to the 8th and 9th centuries A.D. Modern Japanese is based upon the dialect of Tokyo, which became the capital of Japan in the latter part of the 19th century. Japanese is the language of some 60 million people, chiefly in Japan, but also in Korea, America, and various islands. From a morphological point of view it is largely agglutinating, although there are marked tendencies toward flexion. Its accentuation is very typical,

inasmuch as dynamic stress, although decidedly present, has no centralizing effect resulting in rhythmical stress groups. The syllable is the unit of rhythm, and the vowels, which are considerably more constant than the consonants, always possess a clear timbre, which excludes the occurrence of any so-called indefinite vowel like the [ə] in Engl. *lover* [lʌvə(r)].

Korean

Korean is an agglutinative language resembling Japanese, to which it is perhaps related. It is used by some 17 million people occupying the peninsula of Korea. Its vocabulary contains many Chinese words, but its morphology and syntax are purely Korean. Until the 15th century A.D. it was written exclusively in Chinese characters. A special alphabet, based upon that of Sanskrit, was then invented, in which the vowels and consonants were separately represented.

Ainu

Another isolated and unclassifiable language of this section of the globe is the *Ainu*, spoken by some 20,000 people in the southern part of the island of Sakhalin and in various islands north of Japan. It is agglutinative, divided into three dialects, and possesses no written literature.

Hyperborean Languages

The so-called *Hyperborean* or *Paleo-Asiatic languages*, of which little is known, comprise the *Yukaghir*, *Chukche*, and *Koryak*, spoken in the northeastern corner of Siberia; the *Kamtchadal*, on the peninsula of Kamtchatka; and the *Giliak* in the northern half of the island of Sakhalin and a small section of the adjoining mainland. They are not written. Their interrelationship has not been established,

except that Chukche and Koryak are considered as cognate to each other.[16]

Basque

Basque is a non-Indo-European language isolated in the midst of Indo-European territory. By its own people it is called *Euskara* or *Eskuara*. In 1873 it was estimated that about 140,000 people speaking Basque were French and about 660,000 were Spanish. In Spain the idiom covers nearly the whole of four provinces in the northwestern region of the Pyrenees; in France it is confined to the arrondissements of Bayonne and Mauléon. Toponymical and other evidence proves that formerly Basque occupied a much larger domain. Numerous hypotheses have been advanced as to its origin, the most probable being that it descends from *Iberian*, which was formerly located in Spain and Southern France. Other theories connect it with Hamito-Semitic, Caucasian, Etruscan, etc.[17] In spite of its geographical compactness and limited area, Basque contains a large number of dialectal varieties whose lines of demarcation cannot easily be drawn because of the many independent and intercrossing isoglosses. Names of places, some of which date from the 8th century A.D., are the oldest documents. The first book was published in 1545, and up to 1880 Basque literature consisted mainly of religious translations. Since then the number of original works has considerably increased. Phonetically Basque is very rich; its morphology is largely agglutinative, and its syntax is extremely complicated. French and Spanish influence has affected the vocabulary to a considerable extent, but the Basque linguistic mechanism permits of very easy word formation by means of suffixes and composition.

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[16] *Cf. ibid.*, p. 118; see also Waldemar Bogoras, "Chukchee," *Handbook of American Indian Languages*, II, pp. 631*ff.*

[17] *Cf.* Schmidt, *op. cit.*, pp. 75, 76.

Caucasian Languages

Between the Caspian and the Black Sea we find two linguistic types which are neither Indo-European nor Semitic nor "Ural-Altaic." These two families of languages, namely, *North* and *South Caucasian*, are spoken by some two million people. They may or may not be interrelated. Their affinities have not yet been established, but each family comprises a certain number of varieties certainly allied. Together with Basque and the Asianic languages they are classified by some under the general heading of the *Japhetic* group.

NORTH CAUCASIAN

The *North Caucasian* group is again divided into an *Eastern* set of languages, extending along the western shore of the Caspian Sea, and a smaller *Western* set, represented by comparatively little enclaves along the eastern shores of the Black Sea and on the banks of the Upper Kuban and Terek rivers. The *Northeastern* group is sometimes called *Chechen* from the name of one of its varieties. Their consonantism is extremely rich and varied, but their vocalism is rather poor. Of their amazing morphological complexity we may form an idea from the fact that Awar, for instance, has as many as thirty declensional cases of the noun. Chechen possesses six nominal genders, of which four are purely phonetic and congruential, based upon no corresponding semantic differentiation. Almost every Chechen noun and many of its verbs are "irregular." However, this elaboration is not the same in all the languages of the Northeastern group; it is certainly reduced to much greater simplicity in those of the *Northwestern* group. In the latter there are three varieties, of which *Circassian* is the best known. None of the North Caucasian languages can boast of a national script or literature.

SOUTH CAUCASIAN

In the *South Caucasian* branch we distinguish five languages, closely interrelated and spoken by some one and a half million people in the Central and Western Caucasus. *Georgian* is decidedly the most important of them. It possesses not only an alphabet of its own, but also a Christian literature from the 10th century A.D. Its verbal flexion is very involved, and its structural type is intermediate between the flexional Indo-European type and the agglutinative one of Turkic or Finno-Ugric.[18]

DRAVIDIAN

Dravidian is spoken by some 63 million people in Southeast India, North Ceylon, and a section of East Baluchistan. Its relationship with Munda is asserted by some linguists, while others reject it as improbable. There are reasons to believe that formerly Dravidian covered a much larger area of India: the Brahui dialect, isolated in Baluchistan, is perhaps the last remnant of an early compact group which was gradually assimilated by encroaching Indo-European dialects. From sources other than linguistic it is known that South India was inhabited long before our era, but we do not know what the languages current at that time were like. Today all Dravida dialects are certainly related; but whether this is the continuation of original conditions or the result of parallel development or racial mixture, it appears impossible to say. A curious peculiarity of a certain number of them is an elaborate system of gender differentiation, found in no other languages of India. With the Munda they share the inclusive (*I* and *you*) and the exclusive pronouns (*we others*,

[18] *Cf.* Meillet and Cohen, *op. cit.*, pp. 327*ff.*; Schmidt, *op. cit.*, pp. 66*ff.*; Friedrich Müller, *Grundriss der Sprachwissenschaft*, III, pp. 2, 49*ff.*, IV, pp. 230*ff.*

not you). Some of them possess a negative verb, obtained chiefly through suffixation. Their verbal conjugation tends toward assuming the form of nominal and pronominal flexion.

From a point of view of topography and degree of civilization linguists distinguish the *Northern* group, uncivilized, disseminated in the form of linguistic islands, inclusive of Brahui; and the civilized, compact group of the *South*, occupying the Indian peninsula and the northern half of the island of Ceylon.

SOUTHERN DRAVIDIAN

The various peninsular dialects are (*a*) *Tamil*, in the southeastern corner of India, from Madras to Cape Comorin, and in Ceylon. It possesses the richest literature of India, if we except Sanskrit. This literary Tamil is very archaic and is hardly understood by the uneducated. Its origin is obscure. A mere variety of Tamil is *Malayalam*, spoken along the southwestern coast, which has developed a literature of its own since the 13th century A.D. (*b*) *Canarese* (about ten and a half million) covers the western side of the peninsula, north of Malayalam, east of Telugu, and south of the Indo-European Marathi. Its coast line extends from Mangalore to Karwar, but several of its subvarieties are fast disappearing. The oldest Dravidian documents are Canarese inscriptions from the end of the 5th century A.D.; a literature has developed since the 9th century. (*c*) *Telugu* occurs along the eastern coast, north of Tamil, from Madras to Kalingapatam, where it borders on the Indo-European Oriya. Its first writer appears in the 11th century A.D.

NORTHERN DRAVIDIAN

The *Northern* dialects are decadent and are being assimilated by their more powerful Indo-European neighbors. The *Gondi*, north of Telugu, the *Brahui* in Baluchistan, and

the *Kurukh* in Chutia-Nagpur are the most important. The latter as well as the *Malto*, spoken in the Rajmahal hills, are believed to be recent encroachments upon Munda territory.[19]

Andamanesian

The *Andamanesian* dialects spoken by the natives of the Andaman Islands in the Bay of Bengal have not yet been connected with any other linguistic group.

Austro-Asiatic Languages

The so-called *Austro-Asiatic languages*[20] are scattered largely as isolated enclaves from Annam to Chutia-Nagpur. They comprise three main groups: *Munda* or *Kol* in the west, that is, in Chutia-Nagpur; *Annamese* in the east, that is, along the coast of the South China Sea; and *Mon-Khmer* in the center and south, between the other two. From lexical and grammatical analogies they are inferred to constitute one linguistic group, although the evidence advanced is not thought to be conclusive. It is even considered possible that this group may be part of a greater family comprising the Malayo-Polynesian languages. But Primitive Austro-Asiatic is as yet not inferable, and its various modern dialects have been so thoroughly influenced by Chinese, Malay, Tibeto-Burmese, and Indo-European that it is difficult to form an opinion of their genealogical membership. A number of them share the same set of numerals, inclusive and exclusive pronouns, pre- and infixes to the exclusion of suffixes, a constant semantic relationship between certain final consonants, etc. However, there are wide divergences of structure, the Munda dialects being agglutinative and the Annamese

[19] Concerning various theories of relationship between the Dravida languages and other groups, see Schmidt, *op. cit.*, pp. 121*ff.*

[20] Schmidt connects the Austro-Asiatic languages with the Austronesian ones and calls them together the *Austric* languages.

monosyllabic. If nevertheless their common origin could be established, we should have a good illustration of the inadequacy of a classification of languages based upon morphology.

MON-KHMER

Mon-Khmer comprises the three civilized languages *Mon*, *Khmer*, and *Cham*,[21] plus many isolated uncivilized dialects, scattered from Annam to Assam and reaching as far south as the Federated Malay States of the Malay Peninsula. The most compact group is Khmer in Siam and Indo-China. The oldest Khmer inscription is from the first half of the 7th century A.D. In spite of their great dissemination all the Mon-Khmer varieties share remarkable grammatical features. In general they ignore the semantic pitch accentuation, and their words are not inflected, although there are signs of former flexion.

ANNAMESE

Annamese, spoken along the eastern coast of Tonkin, Indo-China, and Cochin-China, is considered by some linguists as a transition between Tai and Austro-Asiatic.[22] The one civilized language is Annamese proper, to which are added a number of spoken dialects. The first Annamese book, written with Chinese characters supplemented by phonetic signs of Annamese origin, is from the 15th century A.D. Until the 17th century this writing system was used, but it was then largely replaced by the Latin alphabet. Annamese is most probably akin to Mon-Khmer, but it also shares certain peculiarities with Chinese and Tai. Its history is little known, but in its modern appearance it possesses

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[21] Cham is considered by Schmidt as a mixed or transitional language; *cf. op. cit.*, p. 138.

[22] *Cf. ibid.*, pp. 128, 138.

semantic pitch accentuation of the word and is monosyllabic, unflexional, and analytic, like Chinese.

MUNDA

Munda or *Kol* occupies two separate districts, one around the Himalaya Mountains and the other in Chutia-Nagpur. The Himalayan group is often connected with Tibeto-Burmese.[23] In earlier times Munda was probably spoken from the Himalayas to the Bay of Bengal, but it was gradually displaced by Tibeto-Burmese, Indo-European, and Dravidian. It is known only in its modern form, which has a rather elaborate morphology of the agglutinating type; thus it employs reduplication, affixation, radical alternation, and even vocalic harmony.

CHINESE, TIBETO-BURMESE, AND TAI

These three important collections of languages, also known as *Tibeto-Chinese* or *Indo-Chinese*, are often supposed to form one great family. *Tibeto-Burmese* is probably related to *Chinese*, but *Tai* has affinities both with Tibeto-Burmese and with the Mon-Khmer languages. It is even surmised that the Sino-Tibeto-Burmese groups form one linguistic family with the Austro-Asiatic languages, in which case Tai would be the link between the two extremes.[24]

The three groups are often referred to as monosyllabic, but even their modern structure does not justify such a simple and universal characterization. Certain Tibeto-Burmese dialects still possess syllabic prefixes, while asyllabic prefixes (consisting only of a consonant) are quite numerous in Tibeto-Burmese as well as in Tai. In Chinese, it is true, every

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[23] *Cf. ibid.*, pp. 131*f.*

[24] *Cf.* August Conrady, *Aufsätze zur Kultur- und Sprachgeschichte, vornehmlich des Orients, Ernst Kuhn gewidmet* (Breslau, 1916), pp. 475–504.

apparent sign of prefixation is lost, but in Tibetan there are even morphological alterations of the verb which look like a real conjugation. Moreover, as far as ancient conditions are concerned, it seems quite certain that Chinese, too, operated with morphological derivations, such as conjugational and declensional alterations. Unfortunately, the primitive word roots cannot be isolated in any of these three language groups, mainly on account of the imperfect system of writing. It may be said, however, that they share a common tendency toward monosyllabism, which has been more effective in Chinese than in Tibeto-Burmese and Tai. A result of this tendency is that morphology has become very simple and unimportant, whereas sentence structure is a most essential feature. The syntactical relationship of the parts of the sentence is symbolized by their relative position and by means of so-called empty auxiliary words. Other common features of these languages are the development of a regular system of semantic pitch accentuation in the differentiation of words and the tendency toward substituting voiceless consonants for voiced ones at the beginning of the word.

TIBETO-BURMESE

Tibeto-Burmese is a collection of dialects spoken by some 20 million people in Tibet and a great part of Burma. It comprises the two civilized groups *Tibetan* and *Burmese*, with many varieties and subvarieties. Tibetan has been written since the 7th century A.D., and Burmese since the 11th.

SINITIC

"Chinese," as a generic term for the many dialects and the written language in its various historical forms, is sometimes referred to as *Sinitic* (from the Latin *Sinae* and Greek *Sinai*), in contrast with *Chinese* proper, meaning the modern written language or one or several spoken dialects. Sinitic

dialects are often so different from one another that a representative of one is not able to understand the speakers of another. Chinese inscriptions on various objects are extant from about 2000 B.C., but because of the uncertainty of their phonetic and morphological interpretation they are of only limited practical use for linguistics. Indeed, the Chinese system of writing is largely nonphonetic. Each word is represented by a special character, sometimes purely ideographic, sometimes exactly or approximately phonetic, or rather phonetically borrowed. A phonetic sign in Chinese is one which indicates the pronunciation of a word in a nonalphabetic way instead of symbolizing a reference to an object or "idea" directly. The number of these characters is extremely great, although the usual ones can be reduced to some 4,000. They are classified in 214 groups, according to common parts which are called *keys* or *radicals* and which take the place of our initials in the arrangement of words in dictionaries.

Chinese is a most important language of literature and civilization. Unfortunately, the imperfect system of written symbolization does not allow of tracing the phonetic and morphological history back as far as might be expected from the antiquity of the existing documents. The form of language antedating the 6th century is called *Archaic Chinese.* From then on linguists distinguish three periods of development, according to certain specific features: the *Old Period* from the 6th to the 10th century; the *Middle Period,* from the 10th to the 13th century; and the *Modern Period,* from the 13th century on. In Old Chinese the morphology was already very simple and extremely analytic, but Archaic Chinese seems to have had a system of pre- and suffixes as well as semanto-phonetically changeable radicals.[25] As has already been pointed out, the tendency toward monosyllab-

[25] *Cf.* Bernhard Karlgren, "Le proto-chinois, langue flexionelle," *Journal Asiatique,* Tome XV (1920), pp. 206–32.

ism is most consistently carried out in Chinese; but in order to remedy the resulting inflexibility of the word, many compounds, consisting of two juxtaposed words defining each other, are used. The modern Chinese of Pekin, the *Mandarin*, *Kuan Hua*, or *Guoryu*, has been more or less generalized in certain provinces and has become the language of officialdom. Its words never begin with voiced consonants and never end in any consonant other than the two nasals [n] or [ŋ]. Today Chinese is spoken by more than 300 million people, and the language as well as the civilization has spread to various adjoining countries. Because of their ideographic system of writing, which is the same for the whole of China no matter how great the differences of pronunciation, all literate Chinese can keep in close touch with a literature four millenniums old.

TAI

Of the *Tai* or *Shan* dialects, spoken in Siam and in parts of Tibet, Burma, China, and Indo-China, the best known and most important is *Siamese*, a civilized language with a rich literature. The numerous other dialects, known only in their modern forms, occupy a huge area stretching from China to India, where they form a compact and homogeneous group, with little difference from one dialect to another. The oldest Siamese inscription is from 1293 A.D. Tai tribes probably occupied territories as far north as the Yangtse River; but the Chinese drove them south, and they themselves encroached upon Mon-Khmer. Hence the many mixed languages of the group. There are still many pre-Chinese settlements scattered about in South China. One of them is the *Miaotse* or *Mantzy* group, probably related to Tai, but perhaps also to Chinese or Annamese. We have already said that Tai shows affinities with both Chinese and Mon-Khmer.

Malay-Polynesian or Austronesian Languages[26]

The territory of the *Malay-Polynesian* or *Austronesian* group of languages consists almost exclusively of islands in the Indian and Pacific Oceans and extends from the island of Madagascar to Easter Island, west of Chile. It represents a total distance of 210 degrees of longitude. The various subgroups generally given by linguists derive their names from geographical divisions which do not exactly correspond to linguistic ones. They are the *Indonesian*, the *Melanesian*, the *Micronesian*, and the *Polynesian* groups, differentiated from each other phonetically by correspondences which on the whole are constant. Their morphology and syntax are homogeneous, while their vocabulary is often considerably mixed. Generally speaking, their word radicals are disyllabic with the accent on the first syllable, but comparative studies point to a previous state of monosyllabism. Various classes of verbs are obtained through pre-, in-, and suffixing, and usually the noun has neither inflexion nor gender nor number. Although it is admitted that all the languages of the group are interrelated, the nature and degree of their relationship has in many instances not been established. The available information about them varies a great deal, some having been pretty well investigated, others being still little or scarcely known.

INDONESIAN

The population of *Indonesian* tongue amounts to about 50 millions, two-thirds of whom are subjects of the Netherlands. The islands concerned reach north as far as Formosa Island (inclusive), east as far as New Guinea (exclusive), west as far as Madagascar (inclusive). About eight geo-

[26] Concerning their possible relationship with Austro-Asiatic, see page 416; with Tibeto-Chinese, see page 418; *cf.* Schmidt, *op. cit.*, pp. 147*ff.*

graphical groups can be distinguished, each with a smaller or greater number of dialects. A few of these are: (1) in the *Philippine-Formosa* group, *Formosan* on Formosa Island, *Tagalog*, *Visayan*, *Bicol*, *Bontok* in the Philippines; (2) in the *Celebes* group, *Bugi*, *Makassar*; (3) in the *Borneo* group, *Dyak*; (4) in the *Java-Madura-Bali* group, *Kavi* (extinct), *Javanese*, *Sundanese*, *Madurese*, *Balinese*; (5) in the *Sumatra* group, *Achinese*, *Battak*, *Rejang*, *Lampong*, *Malay*, *Mentaway* (on the island of that name); (6) in the peninsular *Malacca* group, *Malay*; (7) in Madagascar, the *Malagasy* dialects; and (8) in the group of islands between Bali and Celebes on the one hand and New Guinea on the other, *Lombok*, *Paulohi* (on the island of Ceram), etc. Javanese is the only language whose history has been traced back to the extent of some eleven centuries. *Kavi* (= 'the poet's language') is the name for *Old Javanese*, whose earliest document is from about 800 A.D. On the island of Java Javanese is spoken by more than 20 million people in the eastern part of the island; in the western part some seven million speak Sundanese, and in the most easterly corner as well as on the island of Madura about three million natives use Madurese. The population of Balinese speech on the island of Bali likewise amounts to approximately three million. A peculiarity of these four languages (Javanese, Sundanese, Madurese, and Balinese) is that each of them really has two different forms of speech, one official or aristocratic and one common or vernacular form. Official Javanese is called *kromo*, the vernacular goes by the name of *ngoko*.[27] Some of the Indonesian dialects, such as Dyak, Makassar, Bontok, have the rounded palatals *ö*, *ü*, like German. In general the Indonesian consonantism is very stable, and gemination is rare. A number of phonetic laws have been duly established. Loan words from various sources, such as Sanskrit, Arabic, Portuguese, Dutch, Persian,

[27] *Cf.* Wilhelm von Humboldt, *Ueber die Kawi-Sprache auf der Insel Java*, I, (Berlin, 1836), pp. 49–59.

Dravidian, Chinese, etc., are frequent. The western dialects have many peculiar bilingual doublets: for instance, Sanskrit-Kavi *çapatha-mangmang* = 'malediction', Persian-Malay *džawhar-manikam* = 'jewel',[28] etc. The personal pronoun possesses an isolated and a suffixed form. There are as many as seven different kinds of articles, although the number is actually less in each individual dialect. In counting, the decimal system is the rule. Reduplication with various meanings is a common phenomenon. Occasionally the reduplicated part is repeated several times with an intensified value: thus, Mentaway *igi* = 'numerous', *igi-igi-igi-igi* = 'more numerous than anything imaginable.' The writing systems used in Indonesian territory are based upon the Sanskrit, the Arabic, or the Latin alphabet, the latter being spread by Dutch officials and schools.

MELANESIAN

Melanesian is roughly bounded in the north by the Equator, in the south by the 23d parallel of latitude, in the east and west by the 140th and 175th meridians of longitude east of Greenwich. The most important groups of islands are those of Solomon, Santa-Cruz, Torres, Banka, the New Hebrides, Loyalty, and Fiji. The Fiji dialects have been studied pretty well, but because the Melanesian languages have never had a graphic system, they are known only from notations by European travelers and missionaries who were not always linguistically equipped for scientific observation. Some of the general characteristics are reduplication, isolated and suffixed personal pronouns with a dual, trial, and both an inclusive and an exclusive form. The numeral system is quinary on some islands, decimal on others, and vigesimal still elsewhere. On the Loyalty Islands, for example, the word for *human being* is the same as for *twenty* (= 4 × 5

[28] *Cf.* Meillet and Cohen, *op. cit.*, p. 432.

fingers or toes); the number 40 is symbolized by the same symbol as "two human beings."

MICRONESIAN

Micronesian is spoken on the islands situated between the Equator and the 20th parallel of north latitude on the one hand, and between the 130th and 175th meridians of longitude east of Greenwich on the other. It comprises among others the Gilbert or Kingsmill Islands, the Marshall Islands, the Carolines, the island of Yap, and the Mariana Islands. However, the dialects spoken on the Pelew Islands of the Caroline archipelago and the Chamorro dialect of Saipan Island belong to the linguistic group of the Philippines. Phonetically and morphologically the Micronesian languages are very much like the Melanesian ones. A curious situation, unique in the Malay-Polynesian family, prevails in the pronominal field, where we find a dual, a trial, and a quatrial, with inclusive and exclusive forms.

POLYNESIAN

The *Polynesian* languages are situated east and south of Melanesia; they are found on such islands as the Samoa or Navigator Islands, the Cook or Hervey Islands, the Society Islands, the Tuamotu Islands, the Tonga or Friendly Islands, the Gambier Islands, Easter Island, New Zealand, the Chatham Islands, the Marquesas Islands, the Hawaiian Islands, and some that belong geographically to the Melanesian group. Polynesian is closely related to Indonesian but is characterized by a very striking tendency to eliminate the consonants. Thus, Malay *akar* (= 'root') > Maori (New Zealand) *aka* > Hawaii *aa*.[29] It has no rounded palatals, no diphthongs, no consonantal clusters, no closed final syl-

[29] *Cf. ibid.*, p. 450.

lables, and it uses reduplication. The article has a plural form, a feature unknown to the other Malay-Polynesian languages. The numeral system is decimal, and the personal pronoun possesses a singular, a plural, and a dual, an inclusive and an exclusive form. The Polynesian population is steadily decreasing.

Papuan

The languages of New Guinea and some of the islands in its vicinity are not sufficiently known to be classified. From the contradictory evidence given by various scholars it may be inferred that in New Guinea some dialects are probably of the Malay-Polynesian type, while others, known as the *Papuan* languages, have nothing in common either with the latter or with the dialects of the Australian natives. Many of these languages occupy only a few square miles. P. W. Schmidt attempts a classification based upon various phonetic and grammatical features but recognizes its hypothetical and provisional character.

Australian Native Languages

The relationship of the different native forms of speech current on the Australian continent has not yet been determined. Of a total population of under six million only some 60,000 are natives, and their number is on the decrease. There is great need for a scientific study of these languages before they die out. From the scant and often unreliable information at hand some scholars surmise that they are interrelated and go back to an original unit. P. W. Schmidt divides them into a *Northern* group of languages whose relationship is certainly not inferable, and a *Southern* group which reveals a certain unity.[30]

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[30] *Cf.* Schmidt, *op. cit.*, pp. 155*ff.*

Tasmanian

Tasmanian, which used to be spoken on the island of Tasmania but is now extinct, seems to have formed a group by itself.[31]

American Indian Languages

Under the name of American Indian languages are grouped all the languages that were spoken in North and South America before the advent of the Europeans. The maximum number of American natives at the time of the discovery by Columbus is estimated by P. Rivet at 40 or 45 million, of which about 1½ million occupied the territories north of Mexico.[32] Considering the tremendous area involved, the density of the indigenous population was very low, and the resulting isolation is perhaps partly responsible for the great diversification of the aboriginal languages. Today there are less than half a million Indians in North America, while Central America shelters some 6½ million and South America perhaps 8½ million. If these figures are approximately true, the total population has shrunk to one-third of what it was at the end of the 15th century.

Judging from anthropological and various cultural characteristics, it is not at all impossible that there was once a common American Indian language from which the numerous existing dialects may have developed, but there is no linguistic evidence to this effect. So far as is known, these tribes, with the exception of only a few in Central America, never invented a real system of writing. The Peruvian *quipus*,[33] consisting of cords of different colors with a number of knots, served hardly any other purpose than that of count-

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[31] *Cf. ibid.*, p. 161.
[32] *Cf.* Meillet and Cohen, *op. cit.*, p. 601.
[33] *Cf.* Paul Radin, *The Story of the American Indian*, pp. 130, 134; C. R. Markham, *Ollanta*, pp. 2*ff*.

ing and remembering events. Neither they nor similar devices found in other sections of both the Americas can be looked upon as systems of symbolization from which much linguistic, especially classifying, evidence could be deduced. The so-called pictographs, or pictorial figures on the human body, on stones, bones, wood, leather, or shell, were undoubtedly understandable by the individual members of the respective tribes, but they, too, are of very little use to the linguist. The only real writing systems are found among the Aztecs (or Nahuatl) and some neighboring tribes and among the Mayas, of Central America. A good many of their writings have survived and more are being discovered, but their value is likewise of a relative nature. The Aztec tribes used hieroglyphic signs,[34] written on deerskin or felt, and not seldom accompanied by Spanish translations or by transliterations in Latin script. The signs are partly pictorial, partly phonetic, inasmuch as two or more pictures may be combined to represent the syllables of a word without there resulting any corresponding semantic combination. Very often the interpretation of these documents remains doubtful, since the phonetic parts of the characters are not chosen with a scrupulous care for accuracy and may be represented by different signs only approximately homophonous. As for the Maya texts, they also are of the hieroglyphic type, written in codices or found as inscriptions on monuments. The key for their complete deciphering has not yet been found, but the names of numbers, days, and months have been ascertained, so that the Maya calendar system is more or less known.[35] Aside from these comparatively few sources of information and a number of word lists collected by missionaries or explorers, we have only recent texts and grammars of various dialects.

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[34] *Cf.* Radin, *op. cit.*, p. 119.

[35] *Cf. ibid.*, pp. 68*ff.*; D. G. Brinton, *The Maya Chronicles*, pp. 37*ff.*, 50, 61*ff.*; Markham, *op. cit.*, Introduction.

The present diversification of the American native idioms is so great that it becomes extremely difficult, if not impossible, to establish any genealogical connection between them. In most cases the evidence available is primarily lexical and, therefore, of no more than provisional value. No morphological or phonetic characteristics can be pointed out as common to all the dialects, and no comprehensive comparative grammar has yet been attempted. All the idioms do not even share the features of polysynthesis and incorporation.[36] Besides, many dialects which acted perhaps as links between two widely discrepant surviving varieties have died out, and others are rapidly disappearing.[37] There can be little wonder, then, that the number of languages or dialectal groups without any known relationship is still very great. According to Rivet's enumeration in Meillet and Cohen's *Langues du monde* it amounts to 123. In North America alone the number of families singled out varies from 54 (Uhlenbeck) to 26 (Rivet) inclusive of Eskimo, which, however, is today believed to be related to Finno-Ugric, or rather to the Uralian type common to Finno-Ugric and Samoyedic. Radin's classification, which reduces the North American families to only three (exclusive of Eskimo),[38] is considered to be no more than a bold hypothesis.

Recent studies and comparisons, however, have succeeded in bringing under one heading various languages which used to be thought of as independent. For example, the Na-Dene group, occupying territories all the way from the Atlantic coast to North Mexico and from the Pacific to Hudson Bay,

[36] For instance: "Maya is simple in construction. It is analytic rather than synthetic; most of its roots are monosyllables or disyllables, and the order of their arrangement is very similar to that in English." Brinton, *op. cit.*, pp. 27, 32; *cf.* also Franz Boas, *Handbook of American Indian Languages*, Introduction, pp. 74*ff.*

[37] *Cf.* Clark Wissler, *The American Indian*, 2d ed., pp. 403*ff.*

[38] *Cf.* Radin, "The Genetic Relationship of the North American Indian Languages," *University of California Publications in American Archæology and Ethnology*, Vol. XIV (1918–19), pp. 482–502.

comprises the three subbranches of Athapascan, Haida, and Tlingit. In the phonetic field they share frequent gutturals, clicks, and aspirates; their morphology is marked by the most intricate verbal forms, due to altered affixes and radical changes of a semantic or syntactical value. Similarly, the Uto-Aztec group comprises the three branches of Shoshonean, Pima-Sonoran, and Nahuatl, covering large territories both in North and in Central America.[39] It is also known that not a little migrating has taken place on the part of many indigenous tribes, and the concomitant result of linguistic mixture is inferred not only from lexical comparisons, but also from nonlinguistic facts of history.[40] In various instances a dialect is found to acquire a predominance over others and to spread over the territories of the latter, either stifling them to death or coexisting, as a sort of *lingua franca*, alongside them. This was, for example, the good fortune of Quechuan (or Runa-Sini), the only South American language of culture before Columbus. It became the official language of the Inca Empire which at the time of the advent of the Spaniards extended from the boundary of Colombia and Ecuador down into Chile. Under the Spanish rule its spreading was not checked but rather favored by the practice of the Christian missionaries who used it as the vehicle of evangelization among the various tribes. Events of a similar nature are found in the history of the Tupi-Guarani family, which at the beginning of the 16th century was confined to Paraguay and the surrounding Argentinian provinces. The arrival of the Europeans caused a variety of this family to be adopted by the missionaries for proselyting purposes, so that the heterogeneous tribes of the Amazon region and, for that matter, of the whole of Brazil that came into contact with the whites eventually became bilingual, knowing their own dia-

[39] *Cf.* Wissler, *op. cit.*, p. 403.
[40] *Cf.* Radin, *The Story of the American Indian*, *passim*, but particularly Chap. xiii.

lect and the Guarani *lingoa geral.* A peculiar situation, caused by circumstances of emigration and conquest, is that which arose in the Antilles. These islands used to be occupied exclusively by the South American Arawakan tribes. But shortly before the Spanish advent, another South American tribe, the Caribs, conquered the Lesser Antilles and drove the Arawak men away or killed them, while they took the women as their wives. The latter, however, went on speaking Arawakan in spite of their husbands' Carib speech. Although the children learned both languages, Arawakan continued to be used only by the females and Carib by the males, a condition which has not yet fully disappeared today. That the influence of the women became greater than that of the men is shown by the fact that the male Carib speech took over all kinds of features from the female Arawakan.

It is, of course, impracticable, even if it were profitable, to enumerate here all the Indian languages. The following are just the names of the most important North American branches: Eskimo, Algonkian, Hokan, Iroquoian, Na-Dene, Penutian, Siouan, Uto-Aztec (partly in Central America).

African-Negro Languages

Unlike America, the Black Continent presents the picture of a considerable linguistic homogeneity. If we disregard the Hamito-Semitic languages spoken in the North and the idioms of the Hottentots, the Bushmen, and the Pygmies in various districts of the South, there is left a vast area with hundreds of dialects whose relationship seems to be sure. Although diversification of the Sudanese languages is much greater than that of the Bantu, Maurice Delafosse believes that they all possess so many common characteristics of importance that they must descend from the same ancestor, which may be called the primitive African Negro

language.[41] P. W. Schmidt, however, objects to such a synthesis.[42] The reasons for such a surprising uniformity are little known. The density of the aboriginal African population is much greater than that of the pre-Columbian American Indians. Whereas the whole of Africa has an area of approximately 11½ million square miles, of which only about two-thirds is inhabited by some 90 million Negroes or Negrillos, both the Americas with their 17 million square miles used to contain only 40 or 45 million natives. It is considered possible that the Sudanese and Bantu languages represent a younger stratification, preceded by an older one at a not very distant but unknown date, of which the Hottentots, Bushmen, and Negrillos have preserved the last remnants. In any case, this linguistic compactness is a fact whose strangeness is increased by the probability that for the last four or five centuries not only the distribution of the various languages but also their vocabulary has changed little. This is inferred from a number of words, expressions, and sentences quoted by several writers at various periods of the past.

Of the *Paleo-African* languages *Hottentot* is the best known, but its relationship with *Bushman* appears to be assured. The latter represents perhaps the more original linguistic type, while Hottentot shows many traces of Hamitic influence.[43] It is quite certain that the Hottentots used to occupy much larger territories, and it is even surmised that they once were the neighbors of the Hamites. The Hamitic influence found in many African Negro languages is very puzzling and must be very old. Of the idioms spoken by the Negrillos scattered from the Upper Nile down to Cameroon and beyond, hardly anything is known. These dwarfs, whose mental development is perhaps the lowest found among

[41] *Cf.* Meillet and Cohen, *op. cit.*, pp. 463*ff*.
[42] *Cf.* Schmidt, *op. cit.*, pp. 100, 103*ff*.
[43] *Cf. ibid.*, pp. 82*ff*.

human beings, usually speak the Negro tongue of their neighbors; but their introduction of a number of different words, of different musical tones and clicks, has raised the question whether they also possess speech forms of their own, related to Hottentot and Bushman. The occurrence of clicks in various numbers is a peculiar feature of these ancient languages, while the pitch accent is never used for syntactical purposes and is generally less developed than in Bantu and Sudanese. Hottentot words are always monosyllabic, unless they are derived or compound. The language possesses a first-person dual and plural of both the inclusive and the exclusive type; its verbal modes and aspects are numerous, and its conjugation is divided into an affirmative and a negative one.

Several proposals of classification are made for the other Negro dialects of Africa. While the one heading of *Negro African* may be applied to all of them, it is useful to distinguish at least two large branches. The *Bantu* group, covering roughly the area south of the Equator, is so homogeneous that all its varieties flow into each other with innumerable slight transitions; the *Sudanese* branch, north of the Equator and south of the Hamito-Semitic languages, consists of many subgroups widely different from one another but each with a striking homogeneity of its own. Neither between these two large divisions nor between Sudanese and Hamito-Semitic are the boundaries clearly traceable. On the one hand there are many mixtures of Arabic and Negro and many hybrid, hardly classifiable varieties of a Hamito-Negro type; on the other hand we find a considerable number of semi-Bantu languages north of the Congo, in Gabun, Cameroon, Sudan, and all along the Atlantic coast. Some Africanists[44] make of the latter a distinct West African group, of which one outstanding characteristic is its advanced mor-

[44] *Cf.* Lilias Homburger in Meillet and Cohen, *op. cit.*, pp. 587*ff.*, and Schmidt, *op. cit.*, p. 89.

phological simplification as compared with either Bantu or Sudanese. This may be due simply to foreign influences resulting from more frequent intercourse and mixture between various types; or it may be that these semi-Bantu languages are descended from a sister language of Primitive Bantu itself.

Beyond these great divisions a classification becomes extremely difficult because of the lack of texts. Of a total number of some 435 Sudanese languages given by Delafosse, only five or six are written. These are *Vai*, of the Nigero-Senegalese group, with a native syllabic system of writing; *Mom* (or *Bamun*), of the Nigero-Cameroon group, with characters originally ideographic but subsequently phonetic; *Kanuri*, of the Nilo-Chadian group, *Haussa*, of the Nigero-Chadian group, and *Peul*, of the Senegalo-Guinean group, with Arabic alphabets; and finally *Nubian*, of the Nilo-Chadian group, which was written in Coptic characters from the 4th to the 7th century but is now using characters of a Semitic type. There are numerous texts in Peul and Haussa, but they are of little avail for general purposes of classification, since the remaining 429 languages of the Sudan are not written. Of them we have only a few lists of words here and there, some religious texts and translations, or other data furnished by missionaries, travelers, or officials whose want of linguistic preparation largely impairs the evidential material. A serious investigation into the linguistic world of the African Negroes has only just begun and has yielded only a few reliable grammars. It is inevitable, then, that any classification will have to be geographical rather than genealogical.

Among the characteristics that all Sudanese and Bantu dialects share, we may mention the following. Generally speaking, the nouns are grouped in a number of classes according to the character of things referred to. The phonetic symbols for this nominal categorizing are prefixes,

suffixes, or both. In some languages nominal classification is very consistent, in others it is less so or entirely obliterated, the Bantu group being in this respect more conservative than the Sudanese. Where nouns are no longer classified in this way, there is often no difference left between noun and verb, which must then be inferred from mere word order. Furthermore, there are a few fundamental verbal aspects which can be found all over the Bantu and Sudanese territory although their phonetic symbolization may widely differ. Aside from loans, the radicals of words as well as affixes are astonishingly uniform, and the morphological devices present great similarities. Musical tones, now etymological, now grammatical, are frequent but not universal. The differences between the many dialects are supplied by all kinds of variations grafted upon the above common features.

Delafosse divides Sudanese into 16 branches with 435 languages. Their greater diversification allows of such a division, but it is not so easy to point out any coherent subgroups of Bantu, because here the uniformity is so remarkably great. *Bantu* means 'human being' and illustrates at the same time the process of nominal classification. The radical of the word is *-ntu*, and the classifying prefix for living beings in the plural is *ba-*. *Mu-ntu* would mean 'one human being', while *ki-ntu* means the same as 'a thing.' The name is given to the whole family because it is found with little variation in all the dialects. *Swahili*, spoken on Zanzibar and neighboring coasts, has been written with Arabic signs; whatever else there is in the way of Bantu evidence is in Latin characters. But aside from a few words quoted by Arab writers from the time of our Middle Ages we possess only such documents as were written by European missionaries or travelers. It is probable that Bantu has displaced Hottentot and the Pygmies' languages, whereas it itself has had to yield to the influence of the Indo-European of the South (Dutch, English). The phonetic make-up of the Bantu idioms is charac-

terized by its sonorousness. All finals are vowels, and loose syllabic contact is quite prevalent. Hence, consonantal clusters are rare, the only ones consisting of nasal and consonant or consonant and *w* or *y*. If words are borrowed from foreign tongues, they have to submit to this custom, so that *Christus* becomes *Kiristi*.[45] The stress accent is attached to the penult, and pitch accentuation of the word is found in a number of dialects. In the Southeast there are several languages with clicks. As a rule, the morphological value of the prefixes is lexical, while that of suffixes is categorial or syntactical. The semantic rôle played by the vowels is remarkably reminiscent of what is found in Semitic. Thus Sotho (in the Northeast of Cape Colony) *ho finella* = 'to tie strongly', *ho finolla* = 'to untie.' As for the verb, there is one verbal conjugation for actions and one attributive conjugation for states.

As a result of European trade a number of creolized trade languages have developed along the Atlantic coast. They are chiefly *Negro-Portuguese*, *Negro-English*, and *Negro-French*, with a European vocabulary but a Negro grammatical mechanism. There is also a genuine African dialect, *Haussa*, which has extended far beyond its home territory between the Niger River and Lake Chad. Its relationship with Hamitic, Sudanese, and Bantu is the object of much contradictory discussion.[46] If Arabic be excepted, Haussa is considered the most widely spread language of the whole of Africa. As a trade language it is used almost throughout the Western and Central Sudan and reaches as far north as the African trading ports of the Mediterranean.

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[45] *Cf.* Meillet and Cohen, *op. cit.*, p. 563.
[46] *Cf.* Schmidt, *op. cit.*, p. 115.

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