PREFACE

This book attempts to present the principles of psychology which underlie the problems of speech. The writing had its origin in a need that was satisfied by no other published texts in the fields of psychology, speech, or language. In teaching the psychology of speech, the author has found that any discussion of the interrelationship between speech and allied subjects inevitably leads into the fields of the psychology of language, the pathological aspects of speech, and the development of personality. All of these are aspects of speech; but no book with which the author is familiar has treated them in their relation to each other and from this common point of view. It is hoped, therefore, that students of language and speech, as well as of psychology, will find this volume useful.

The reader must not, however, think that this work is a textbook on speech pathology, or a complete treatise on personality or any other single aspect of speech treated in the book. Disorders of speech and personality are treated so that the reader may attain a better understanding of normal speech. We study personality changes and pathological conditions, with their reflections in speech, only as a means of better appreciating the speech problems of the normal person.

The writer wishes to acknowledge his indebtedness to those authors and publishers from whose works he has quoted and who are mentioned specifically throughout the book. More personal acknowledgments are due to Professor Andrew T. Weaver of the University of Wisconsin for his

criticism of the manuscript; to Professor James M. O'Neill of Brooklyn College for his many helpful suggestions in the course of the preparation of the manuscript; to Dr. William Etkin of the College of the City of New York for his assistance in the writing of Chapter III; and to Miss Lee Eisenson for the typing of the manuscript. The writer also wishes to thank his young daughter for (tacitly) allowing him to quote her here and there in the book.

It is not possible for me to try to weigh my debt to my wife, whose encouragement, patience, and understanding have helped me immeasurably in writing this book.

JON EISENSON

EDITOR'S INTRODUCTION

Nearly a decade ago, Charles Henry Woolbert wrote: "In teaching boys and girls how to speak in public and how to read the printed page aloud, the speech teacher perforce becomes psychologist. In the teaching of these disciplines, we cannot even get started without running afoul of almost every chapter heading in psychology: mind, meaning, intellect, habit, thought, emotions, feeling, imagination, image, understanding, belief, attention, perception, reasoning – these are the necessary tools of the speech teacher's equipment. There's a reason; for speech training is nothing more or less than a form of applied psychology."

The truth expressed by Woolbert has long been recognized by teachers of speech; Aristotle, Cicero, and Quintilian developed their philosophy and pedagogy of speech on the groundwork of the psychology of their time and practically every significant treatise on the subject from their day to ours has embodied the guiding principles provided by contemporary psychology.

The diversified, modern college and university curriculum reflects a growing appreciation of the close relationship between psychology and speech; courses in *the psychology of speech* are one major evidence of this fact. However, those of us who have had the temerity to teach such "synthetic" courses have waited impatiently for the appearance of a satisfactory textbook. Although this "demand" has been felt for lo! these many years, the answering "supply" has been extremely slow in arriving. Why? The principal reason can be ascribed to a serious weakness in psychology itself.

One of the most disturbing aspects of psychology during the last quarter of a century has been its sharp schisms into hostile "schools" which have competed with each other for converts and adherents. We have been propagandized by *functionalists, structuralists, vitalists, behaviorists, gestaltists,* and others almost too numerous to mention, with the result that the strife among these sects has projected itself into allied fields, including speech. Consequently, it has been exceedingly difficult for anyone to produce a textbook which would present the psychology of speech from a viewpoint acceptable to more than one of the several warring factions.

It is my hope and belief that at long last someone has succeeded in this aim. Dr. Eisenson, whose early training and broad interests in psychology led him into the field of speech, has written with charity for all and with malice toward none. He has stressed agreement and minimized disagreement in the field. He has accomplished a reasonable reconciliation of divergent theories. He has been eclectic without weak and confusing compromise. He has been progressive without going too far "to the left." He has remained safely "orthodox" without danger of becoming quickly "dated."

Here, then, is a text which I shall find most useful in teaching my course in the psychology of speech, and I predict that many similarly situated in other institutions will rejoice with me in having it available.

A. T. WEAVER

TABLE OF CONTENTS

Preface vii
Editor's Introduction ix

PART I. THE NATURE AND ORIGIN OF SPEECH

CHAPTER
I. The Nature of Speech 3
II. The Origin of Speech in the Race . . 13

PART II. BASIC PSYCHOLOGICAL ASPECTS OF SPEECH

III. The Nervous Mechanism and Speech . . 31
IV. Emotion and Speech 53
V. The Psychology of Learning as Applied to Speech 63
VI. The Psychology of Meaning . . . 72
VII. Speech and Thought 89

PART III. THE DEVELOPMENT OF SPEECH AND LANGUAGE IN THE CHILD

VIII. The Evolution of Speech in the Infant and Child 113
IX. Language Development in the Child . . 124
X. Disorders in the Speech of Children . . 135

PART IV. PERSONALITY AND SPEECH

XI. The Speech Personality 145
XII. Personality Deviations and Speech . . 158

A. The Blind 158
B. The Stutterer 165
C. The Manic-Depressive . . . 172
D. The Schizophrenic . . . 175
E. The Aphasic 179

PART V. THE PSYCHOLOGY OF THE AUDIENCE

XIII. The Speaker-Audience Relationship . . 195
XIV. Attention 210
XV. Interest 233
XVI. Impressiveness 241
XVII. Motivation 248
XVIII. Stage Fright 260

Bibliography 268
Index 273

LIST OF FIGURES AND TABLES

Summary of Ten Gesture Words, and Dr. Whymant's Selection of Proto-Polynesian and Archaic Japanese Words of Similar Meaning . . . 23, 24

Figure 1. The Central Nervous System as a Whole . 33

Figure 2. Primary Motor Neuron (Diagrammatic) . 36

Figure 3. Diagrammatic Representation of a Simple Spinal Reflex Arc 37

Figure 4. Diagram of the Spinal Arcs Involved in Scratch Reflex (Dog) 39

Figure 5. Diagrammatic View of the Left Surface of the Cerebral Hemispheres Showing Cortical Areas Involved in Speech 44

Mean Per Cent of Each Part of Speech by Age and Sex . 130

Comparison of Normal and Feeble Minded Boys and Girls as to Age at Which Talking Began . . . 132

Mean Number of Words Used at Each Mental Age . 133

Mean Number of Different Words Used at Each Mental Age 133

Types of Audiences and Speaker Tasks . . . 208

PART I

INTRODUCTION

THE NATURE AND ORIGIN OF SPEECH

CHAPTER ONE

THE NATURE OF SPEECH

Preliminary Considerations

Broadly stated, language is any system of recognized symbols used to produce or prevent specific responses of thoughts, or feelings, or actions. The system of symbolization may be visible and direct, as the sign language of primitive man, the Indian, and our more primitive cave-dwelling ancestors, or the gesture language employed by many deaf-mutes; or the symbolization may be visible and indirect, in that the producer of the stimuli does not himself see the reactions of the recipient, as the smoke signals used by the American Indian and the American boy scout, or the written and printed symbols of letters, newspapers, and books. The language symbols may bring reactions through tactile appeal, as the Braille print of the blind. Finally, the symbols may consist of audible stimuli, as in normal speech. The audible stimuli, as we shall see later, are themselves products of visible stimuli, and are still frequently accompanied by visible stimuli.

The terms of our definitions carry with them certain responsibilities which must be met or at least explained. The first statement, "language is a system of recognized symbols," means that the symbols used must be common to at least two persons, though most symbols are common to many people. No one person can have a language all his own. But two people may, and frequently do. Any two people who tend to be very much together, twins or lovers, for example, generally develop a few gestures, auditory symbols, or tactile symbols which are not understood by

others, but which are used as common coin by the two.

But before we proceed we must explain the significance of "symbol." A symbol stands for something else. It implies that a connection of some sort has been made between a word and an object, or a word and an idea. The connection must be formed in such a way that the name of the object or idea recalls the object or the idea – an act or feeling associated with an object or objects. The word is the sign for the object or idea. As such it causes the individual to whom the word is a stimulus to experience a set of reactions involving either or both the voluntary and involuntary muscles. The innervation of the muscles need not result in overt action. Frequently, as in thinking, the actions are only incipient. How these associations are made – how the word acquires signal functions – we shall learn later in our consideration of the problem of the learning of language. But the signal function of the word and its ability to produce an organic attitude must be recognized before we can proceed with a consideration of the second term of our definition of language, "used to produce or prevent specific responses of thoughts, or feelings, or actions."

What is meant by *specific responses?* A specific response is differentiated; it can readily be distinguished from other responses of a similar or related nature. A specific response, at least at the beginning, is voluntarily produced and controlled by the behaving organism. The response is appropriate to the stimulus that called it forth. For example, the child's utterance of the word "water" when he is thirsty is a specific response to the stimulus "thirst." By using the word "water" he brings about the further specific reaction on the part of someone in his environment of having water brought to him. Specific responses arise out of definitely felt needs or wants and are intended to satisfy these needs

or wants. It is this characteristic which leads us to believe that the use of language is peculiar to man. Lower animals utter cries and perform bodily actions that closely parallel the human's use of words. The important distinguishing feature is that the "audible language" of lower animals, including that of the ape, does not result in causing specific responses to occur in other animals. The animals below man produce sounds which bring about emotional reactions broad and crude in nature and characterized by a *lack of specificity*. Yerkes [1] describes a series of experiments in which he tried to determine whether apes use speech in the human sense. He found that apes do not use language and that the various sounds produced by the ape are innate emotional expressions. The sounds lacked differentiation and because of this were indicative only of the presence of some emotional state in the ape but *not* of one particular emotion. The reactor indicated by his responses that he recognized only the existence of an agitated state in the ape. Before the reactor could respond specifically to the stimulator he had to become an observer as well as an auditor. Not until the stimulator described his emotional state by appropriate bodily actions did the reactor understand, and by understanding, specifically respond. At best, the responses of the apes were crude compared with the responses of humans.

The Relationship of Speech to Language

Speech is that form of language which man produces *without resorting to agencies outside of his own organism.* The printed word, the picture, and other such symbolic means of causing responses are not, in our sense of the

[1] R. Yerkes, *Almost Human* (The Century Co., 1925).

term, considered speech. The signs of speech are the spoken and visible symbols that man produces without the use of tools. Man's own body is the sole agency for the production of speech. When man has to resort to the use of outside agencies such as the pen, or the printing press, or the paint brush, or the chisel, he is writing, or painting, or sculpturing; he is using symbols to express himself. Directly or indirectly, immediately or remotely, he is causing responses to occur in others; he is using language. But, because he is employing external agencies, he is not speaking. We shall in this study be chiefly concerned with spoken symbols – oral and visible – which man produces solely through the use of his own organism.

The Functions of Speech

In general, as we have said, the function of speech is to cause responses of thoughts, feelings, or actions to occur in someone. These responses may result in accomplishing one or more of several ends.

1. *For Communication.* Speech may be used to communicate ideas, with social adaptations as the purpose. This is perhaps the highest and most civilized of the functions of the spoken word. Unfortunately, many students of speech and language have allowed themselves to commit the error of believing that communication is its sole function. That this is not so will soon be demonstrated. Nor must we make the error of thinking that when man communicates he always wishes to express or reveal the true state of his mind. Frequently he attempts to do quite the opposite in communication, else liars would never talk.

2. *For Enjoyment of Utterance.* Speech may be used for the pure enjoyment derived from its utterance. Children

very frequently, and adults, even in civilized society, often speak for the sake of the pleasure derived from the exercising of the vocal cords and the speech mechanism as a whole. Jespersen, quoting Mme. de Staël, says, "It is not only, as it is elsewhere, a means of communicating thoughts, feelings, and doings, but an instrument that one loves to play on, and that exhalts the spirit just as music does to some people and strong drink to others." [2] The adult person rehearsing a speech or even a single word to get the feeling tone of what he is saying indulges in the use of the word with pleasure as the immediate end. He is eliciting responses from himself. If he reacts favorably, he may repeat the word; if the reaction is unpleasant he may try another stimulus, a different word, or a different emphasis or inflection, until finally he is pleased. The child or adult who talks at great length to a toy, animate or inanimate, also uses the word for the mere pleasure of its use. The lap dog of the society matron, the mongrel companion of the street urchin, or the long-legged stuffed French doll can hardly be said to understand the speaker, but this lack of comprehension in no way stops the flow of words. On the contrary, comprehension on the part of the object addressed might very well stop speech where more fortunate incomprehension does not.

3. *As a Social Gesture.* Speech may be used merely as a social gesture. Sometimes it is of no particular importance whether the person supposedly addressed understands the words directed at him. We speak to foreigners in our own language even though we know perfectly well that they understand not a word of it. The foreigner responds in a language equally unintelligible to us. Yet a definite re-

[2] O. Jespersen, *Mankind, Nation, and Individual from a Linguistic Point of View* (Harvard University Press, 1925), p. 7.

sponse is "stirred up." We do the thing expected in a social situation; we indicate our wish to be friendly. Frequently, even when we use words mutually comprehended, little if anything more than the gesture of sociability is intended by their use. Let us examine, for example, this conversation between two mature, intelligent adults meeting on the street:

"Hello!"
"Oh, hello! How are you?"
"Nice day, isn't it?"
"Yes, nice day."

This type of conversation may be heard wherever men meet. To insist that either participant is revealing his mind, or communicating his thoughts, is to be ungenerous and unkind. Certainly neither is very much interested in the state of the weather; and, very likely, neither is truly concerned about the other's health. The words are used merely as friendly social gestures. Failure to use them might bring about an unfriendly reaction. Men who know each other expect to speak to each other. What is said is often of no importance.

4. To Disarm Hostility. The use of speech to prevent or allay hostility is another aspect of language in social situations. Sometimes a man talks to himself when he suspects that he ought to be afraid, without knowing whether there is actual danger in the situation. We pretend to talk to someone else when entering a dark room, even though the someone else may not be in hearing distance of our words: We approach an ominous-looking stranger and talk to him to "show him that we are not afraid." He may answer us for the same reason. In reality, we are doing the only thing

we can do, using words to prevent an emotional response – fear – when such a response is not adequate for meeting the situation and may result in actual harm.

Elements of Speech

1. The Gesture. The speech symbols produced by man without resorting to agencies outside of his own organism may be visible or audible. The visible word is the gesture, an element that has always played an important part in speech. Primitive man, we have reason to believe, learned to express a variety of ideas by means of bodily movements, particularly movements of the arms, hands, and head. Civilized man, we know, uses gesture either to supplement or reinforce audible speech, or to explain his ideas when audible speech is for some reason inadequate – when the oral word fails him. Gestures, because they are readily discernible and more widely standardized as to meaning than the oral word, become the speech medium among men who have no other common language. It must not be thought, however, that all gestures have universally the same meanings. In the Occident clapping the hands signifies applause; in the Orient hand clapping is a summons. Particular gestures may also assume a local significance which may make their use by a stranger in a community a dangerous exercise. Perhaps the most completely standardized and well-nigh universally understood gesture language is that evolved by the deaf and dumb. The special intertribal sign language of the American Indian, bearing, incidentally, a marked resemblance to the language of the deaf and dumb, is another example of a conventionalized gesture language.

2. *The Oral Symbol.* Among civilized people the oral symbol, the conventionalized sound word, has generally replaced the visible or gesture symbol. How oral symbols developed and became standardized is a moot question. Though they vary widely from language to language, and lack the universal similarity of visible words and their meanings, there are nevertheless sounds which have, or once had, common meanings in many languages. This fact enables linguists to trace relationships among the languages of today. One may conclude, from the observation that similar sound words exist in many languages, either that there was once a single language spoken by all people, or that similar external conditions exercised similar influences on man no matter where he lived, and so resulted in the production of closely related if not identical sounds. We shall further examine these suppositions in our study of the origin of speech. It is our belief that the oral word is an outgrowth of the gesture symbol, a result of the pantomimic movements of the organs of articulation. The postures and movements of the speech organs resulted in the production of identifiably different sounds. Originally sounds were emotional outbursts that served to attract attention to the gestures. Thus, vocalized audible speech is primarily emotional in nature, whereas visible speech is intellectual. The visible elements carry the meaningful content of speech, while voice, the emotional element, carries the feeling tone of what is said. The oral word is a combination of both, enabling man to imbue his ideas with feelings. Thus the function of speech – the causing of responses in the hearer, of thoughts, or feelings, or actions – is carried on. Words have both intellectual and emotional aspects, the amount of each varying with the nature of the speech situation. In due time, we shall consider these aspects of speech.

Types of Situations in which Speech Is Used

We may divide the situations in which speech is used into three main types: (1) Individual-to-individual; (2) Individual-to-self; and (3) Individual-to-group. We shall consider (2) and (3) at length in later chapters on "Speech and Thought" and "The Psychology of the Audience." At present we shall briefly examine each of the situations.

1. *Individual-to-Individual.* This situation is present whenever men meet in ordinary conversation. Responses are elicited by words, and the responses in turn become stimuli which call forth other words. The responses may be emotional or intellectual in character; usually they are combinations of both. The words spoken may be, and usually are, directed at a person present and visible to the speaker. But this is not necessarily so. We may speak to people behind us, or in other rooms. We also speak to people by telephone, and elicit responses from a reactor who may be many miles away from us.

2. *Individual-to-Self.* This type of speech situation, too often slighted by students of language, exists whenever the spoken word is used by the individual as a stimulus which calls forth responses from himself. Whenever verbal utterance is indulged in for the pleasure of the utterance such a situation exists. The babbling child, the adult singing to himself in the privacy of his own room, uses the spoken word for the pleasure he derives from pure utterance. Though an adult usually does not talk aloud to himself because of the pressure of society which carries over even when he is alone, he does hold lengthy conversations with himself whenever he is thinking or engaged in problem solving. The words are spoken implicitly, but spoken nevertheless.

3. *Individual-to-Group.* The typical audience situation, in which one person addresses a group of people, is an example of the individual-to-group situation. Usually the group does not immediately and overtly respond, at least by vocalized words, to the stimuli presented by the speaker. In the classroom situation and the forum discussion, however, overt and vocalized responses are called forth. The group need not be present to the speaker. The use of the radio and the loud-speaker permit one person to speak to others who may be scattered over wide areas.

All speech occasions, no matter what the type, are stimulus-response situations. The words are the stimuli which serve to bring forth responses of thought, or feeling, or action, either from the stimulator himself – the speaker – or from one or more other persons to whom the stimuli are directed.

CHAPTER TWO

THE ORIGIN OF SPEECH IN THE RACE

The origin of speech has been a subject for much speculation and some inquiry for thousands of years. By the very nature of the problem, no one theory of any philosopher, historian, anthropologist, or linguist has ever been widely accepted, or for long. How man first learned to speak was theorized about even in the time of Plato, and is discussed, if not argued, today. If the problem of *how* cannot be answered – and we shall attempt an answer – at least there is no difficulty in determining *why* man learned to speak. He learned because there was a need for him to speak, because the social situation in which he found himself made the spoken word not only a convenience but a necessity. For the present we shall, however, turn our attention to the several hypotheses which seek to explain the origin of the spoken word.

Theories on the Origin of Speech

1. The Divine Origin Theory. "In the beginning was the Word." Language originated as a divine act. The Hebrews held that God gave to Adam a fully developed language. Had it not been God's will to create a confusion of tongues during the building of the Tower of Babel, there would have been no variations in the spoken word. We read in chapter XI of Genesis:

> And the whole earth was of one language, and of one speech.
>
> And it came to pass, as they journeyed from the east, that

they found a plain in the land of Shinar; and they dwelt there.

And they said to one another, Go to, let us make brick, and burn them thoroughly. And they had brick for stone, and slime had they for mortar.

And they said, Go to, let us build us a city and a tower, whose top may reach unto heaven; and let us make us a name, lest we be scattered abroad upon the face of the whole earth.

And the LORD came down to see the city and the tower, which the children of men builded.

And the LORD said, Behold, the people is one, and they have all one language; and this they begin to do: and now nothing will be restrained from them, which they have imagined to do.

Go to, let us go down, and there confound their language, that they may not understand one another's speech.

So the LORD scattered them abroad from thence upon the face of all the earth; and they left off to build the city.

Therefore is the name of it called Babel; because the LORD did there confound the language of all the earth; and from thence did the LORD scatter them abroad upon the face of all the earth.[1]

Plato, too, held that spoken language exists by divine fiat. "Names belong to things by nature." [2] An artisan of words must be "only he who keeps in view the name which belongs by nature to each particular thing." [3] We may infer from this that the original perfect language was the work of the ruler of the universe, a divine entity. Man's failure to discover the original "natural" and "divine" words accounts for imperfections and differences among languages.

The divine origin theory, never seriously held by many linguists, has been given up by them as well as by the theo-

[1] Genesis 11:1–9 (King James Bible).
[2] *Craytylus* (edited by Loeb, G. P. Putnam's Sons), p. 31.
[3] *Ibid.*

logians. Even the latter are now generally ready to admit that man was endowed not with a complete language but rather with the potentialities and capabilities for evolving a spoken language.

2. *The Dingdong Theory.* This theory has about it an air of mystery if not of divinity. Plato long ago propounded the theory, and more recently Max Müller temporarily expounded its principles. According to the Dingdong theory language began as a mystically harmonious response on the part of man's vocal organs (hitherto silent) to a stimulus that nature intended to be used to call forth vocal expression. "Everything that is struck, rings," said the proponents of the theory, and the critics derisively answered "Dingdong." Words, according to this theory, exist by nature rather than by convention; between words and the ideas for which they stand there exists a necessary and inherent connection. Certain words are by nature "right" to express an idea; other words are necessarily "wrong." Those of us who have proper intuition can "feel out" the "right" words to represent an idea, and avoid the "wrong" words. Mark Twain played with this idea in *Adam's Diary,*[4] from which we quote:

Extracts from ADAM'S DIARY

Monday This new creature with the long hair is a good deal in the way. It is always hanging around and following me about. I don't like this: I am not used to company. I wish it would stay with the other animals. . . . Cloudy today, wind in the east; think we shall have rain. . . . WE? Where did I get that word? – I remember now – the new creature used it.

Tuesday Been examining the great waterfall. It is the finest thing on the estate, I think. The new creature calls

[4] Samuel Clemens, *Adam's Diary* (Harper and Brothers, 1904).

it Niagara Falls – why, I am sure I do not know. Says it *looks* like Niagara Falls. That is not a reason, it is mere waywardness and imbecility. I get no chance to name anything myself. The new creature names everything that comes along, before I can get in a protest. And always that same pretext is offered – it *looks* like the thing. There is the dodo, for instance. Says the moment one looks at it one sees at a glance that it "looks like a dodo." It will have to keep that name, no doubt. It wearies me to fret about it, and it does no good, anyway. Dodo! It looks no more like a dodo than I do.

Friday The naming goes recklessly on, in spite of anything I can do. I had a very good name for the estate, and it was musical and pretty – GARDEN OF EDEN. Privately, I continue to call it that, but not any longer publicly. The new creature says it is all woods and rocks and scenery, and therefore has no resemblance to a garden. Says it *looks* like a park, and does not look like anything *but* a park. Consequently, without consulting me, it has been newnamed – NIAGARA FALLS PARK. This is sufficiently high-handed, it seems to me. And already there is a sign up:

KEEP OFF
THE GRASS

My life is not as happy as it was.

3. The Onomatopoetic Theory. According to this theory, scornfully called by its critics the "bowwow" theory, man gave to objects names that resembled their sound properties. Words, then, were echoic, man's echoes of the sounds of nature. Such words as *bang, hiss, roar, boom,* are supposed to be echoic in origin. The proponents of this theory unfortunately do not bother to explain how man learned to imitate the sounds he heard. They evidently assume that man could imitate at will, and so see no problem. This theory further breaks down when we realize that only a

very small number of the words of any language are onomatopoetic in nature, and that even those words which might readily have been so derived are different in the various languages. Certainly we have the right to expect known related languages such as the French, English, and German to have closely similar words for the names of animals which make the same sounds regardless of their place of birth. However, the English *dog* is the French *chien* and the German *hund*. Onomatopoetic words in general constitute the ornaments, the elegant expressions indulged in by poets, rather than the backbone of a language. At best the onomatopoetic theory explains the development of part of the vocabulary of a language, but certainly not the origin of language itself.

4. The Interjectional Theory. The interjectional theory attempts to answer the question of *how* man first discovered that he could speak. In brief, this theory holds that language originated out of emotional responses. Primitive man's grunts and groans, the involuntary noises emanating from the speech tract, or more properly, the digestive-respiratory tracts, arose as man wrestled with the objects in his physical environment. Characteristic grunts and groans became associated with objects and activities which caused the emotional responses, and so a crude system of nomenclature was developed. Though this theory accounts for little more than the existence of interjections in any language, it contains two fundamental postulates of great significance which have been incorporated in a later-developed and generally more acceptable theory. These postulates are:

(*a*) There is an unconscious reflexive vocalization accompanying strong states of physical or emotional activity.

(*b*) The process of associational thinking accounts for the establishment of the meanings of the vocal gestures.

5. *The Gesture Theory.* The gesture theory depends largely upon the interjectional theory for its basic postulates. This theory, probably more than any one of the others, has been maintained and expounded by many students of language and philosophy. An early expression of this theory may be found in the works of Wundt.[5] Bloomfield,[6] who seems to be a disciple of Wundt's elaborates the theory. In general he holds that in the animal world every mental process is accompanied by a corresponding involuntary physical process; these involuntary manifestations of mental or emotional processes are termed *expressive movements.* Such movements exist in human beings as well as in animals and may be evoked by the existence of an intense emotional state. In mild degrees such a state produces rapid pulse and hurried respiration; in severer conditions it may frequently result in facial contortions and twitching of the extremities. Because these are universal reaction patterns, the movements have come to be recognized as indicative of the quality of an emotion, as well as expressive of its existence. The movements have become conventionalized and symbolic, so that by them abstract ideas may be presented. As an example, the localization of taste sensation in the tongue and the consequent facial expressions reflecting the areas of the tongue stimulated, have developed into a conventional imagery capable of expressing concepts about situations in which actual taste – the sensation in the taste buds – plays no part. We speak of a "sweet" sound or a "bitter" thought, though sounds cannot really be sweet because they are *heard* and not *tasted,* nor can thoughts be bitter.

Percepts arising out of situations may also be discerned

[5] W. Wundt, *Völkerpsychologie* (The Macmillan Company, 1928).
[6] L. Bloomfield, *Language* (Henry Holt and Co., 1933).

in gestures. The child's pointing, which arises supposedly out of his original misconception as to the distance between the object and himself, is retained to express the notion that he perceives the object to be present.

In support of their hypothesis Wundt, Bloomfield, and others offer as evidence the existence of complete gesture languages which have arisen and been recorded in various parts of the world since the beginning of man, whenever vocal speech was for some reason either impossible or undesirable. The remarkable feature about all of these gesture languages is their striking similarity and relative uniformity. The gesture language of the American Indian used (as we have already noted) for intertribal communication, the language of the Trappist monks under the vow of perpetual silence, the language of deaf-mutes who have not been trained in speech, and the pantomime language developed by children to keep secrets from others, all are remarkable for their many similar elements. Bloomfield explains this fact by characterizing the movements involved as universally human expressive gestures used for social communication, in which the mimetic elements, by an associational process, have become metaphorical.

The proponents of the gesture theory have the task of explaining how language, originally visible, became vocalized and audible. Bloomfield's explanation is that the movement (gestures) originally produced the sound (Bloomfield did not specify how, Paget later did). The movement, however, was the important thing, and the sound a by-product of the movement. Gradually, however, as a result of continuous association between the sound and gesture, the sound became the more important element, until finally the sound itself came into independent use. (Because the sound is dependent upon movement it can never really

become an independent element.) To explain how sounds became highly differentiated so that a complex vocal language could be formed was a task left to Paget.

6. Paget's Oral Gesture or Tongue Pantomime Theory. Paget's [7] theory is an adaptation and extension of Wundt's gesture theory, under what seems to us to be the influence of Gestalt and Behavioristic psychological thinking. That we ourselves lean toward this theory will soon be discovered. It appears to be well developed from a genetic point of view, and thoroughly substantiated from a psycho-physical point of view. What Paget claims took place in our primitive ancestors he demonstrated to take place in his own speech. It seems to us the only theory supported and substantiated by science and which requires only a modicum of faith for its acceptance.

The earliest human language consisted, most likely, of gesture signs. Primitive man probably was able to express a variety of ideas "intellectual" and "emotional," and to elicit reactions in his neighbors through bodily movements, especially through movements of the hands and face. The sign languages of the American Indian and of deaf-mutes represent gestures that are almost completely standardized and of practically universal significance. Had man not been endowed with physical organs which could produce sound, with sufficient intellect to recognize and profit from a happy accident, and with sufficient discontent to make him want to improve his lowly state, speech as we think of it today might never have been developed. But man had the mechanism – the respiratory tract; the happy accident – the emission of breath or voice – did take place (it had to); and man had still not rid himself of discontent. With the development of gesture signs there was a concomitant

[7] R. A. Paget, *Human Speech* (Harcourt, Brace and Co., 1930).

though unconscious development of laryngeal sounds. The sounds were by-products of the total pattern response of the primitive human organism reacting to specific situations. When man is engaged in an occupation requiring physical exertion, as in chopping trees, or in lifting heavy stones, or in hauling logs, or in throwing a spear, all the organs of the body go through a series of characteristic positions during the execution of the particular act. Each position is assumed by the body as a whole, with each set of muscles entering into the act in a special state of tonus. The muscles of the speech mechanism are, of course, similarly involved. At some time during the performance of the act the muscles of the speech mechanism are likely to be in a state of adjustment conducive to the production of a particular sound. Each time the act or performance is repeated, a particular laryngeal sound will be produced.

Let us take a simple human activity such as looking up at a tall object (the reader might try looking toward the ceiling) and determine precisely how a particular sound might become associated with it. Primitive man – and civilized man when uninhibited – looks up with all parts of his organism: his toes, his legs, his torso, his head; all the organs which are included in the speech mechanism assist man in looking up. Now, if at some time while the lips, jaws, and tongue are busy gesticulating (looking up) air were to pass through the oral or nasal cavities, the result would be a whispered sound, an audible gesture which was produced because of laryngeal movement while breath was being emitted from the mouth. If primitive man happened to be vocalizing, as he might have been were he grunting, or singing, or in some other way giving expression to his emotions, the result would have been a voiced sound rather than a breathed or whispered sound. So, quite by accident,

primitive man probably produced audible speech sounds.

Having discovered audible speech, primitive man probably soon became aware of its superiority over the exclusive use of visible speech. Our ancestors realized that they could now elicit responses from their neighbors without being in their sight, and could engage in speaking even when their hands were occupied. Soon our brighter ancestors began to analyze the speech process and its products. They found that some of the gestures of the tongue and the lips were better able to produce audible speech sounds than others. Up and down and to and fro tongue and lip movements were found to be superior to lateral movements. And so, because certain movements were successful and satisfactory, and because other movements were found to be generally unsatisfactory, the satisfactory movements were learned and maintained. Thus human speech evolved from a system of conventionalized gestures of the organs of speech. Says Paget:

> Human speech arose out of a generalized unconscious pantomimic gesture language – made by the limbs and features as a whole (including the tongue and lips) – which became specialized in gestures of the organs of articulation, owing to the human hands (and eyes) becoming continuously occupied with the use of the tools. The gestures of the organs of articulation were recognized by the hearer because the hearer unconsciously reproduced in his mind the actual gesture which had produced the sound.[8]

In support of this "oral gesture" theory Paget presents a series of "synthetic words" which are made by descriptive gestures of the tongue, lips, and jaw. The "synthetic words" are compared with words in primitive languages which are phonetically almost identical and semantically alike.

[8] *Ibid.*, p. 174.

SUMMARY OF TEN GESTURE WORDS, AND DR. WHYMANT'S SELECTION OF PROTO-POLYNESIAN AND ARCHAIC JAPANESE WORDS OF SIMILAR MEANING.

Meaning.	Pantomimic Gesture.	Phonetic Result.	Proto-Polynesian. Archaic Japanese.
Reach up	Tongue reaching up to *touch* palate	**aθ, aθ, or ad**	**ada, adha-adaru, idaru,** Arch. Jap.
Feel, stroke	„ feeling palate backward and downward	**ðra, ðra, lra, dra**	**tura, tula, tataru,** Hazlewood 246.
Feel smooth, stroke up	„ feeling behind lower teeth and up behind front teeth	**ɑɪl, ɔɪl, ʃɪl**	**-ɑɪla, -ɛɪla, -taira ārɪ, orɪ, olo, oloi** (Nine. Futuna) (W. Churchill Pol. Wand. 391).
Draw back suddenly	„ protruded and withdrawn	**ærap, æðap**	**eðhupu, ðupi,** (Indonesian), Brandstetter and Kern **rap** (Pol. Wand. 305) Aneityum.
Scrape	„ scraped between teeth	**ðap, ðup, ðu**	**ðubu, ðuu** (Indonesian), Brandst. and Kern.
Wave aloft	„ waved, touching palate	**leðl-leðl ledl-ledl**	**lete-lete, vele-vele** (Proto-Indones), Brandst. and Kern. **lele.**[1] (Hawaiian, Fijian) Pol. Wand. 421. Hazlewood 66.

(Per Dr. Whymant) **lɛlɛ** in Fijian—the outer end of tree-branches in Samoan, Hawaiian, Tongan, Futuna, and Efate, either meteor or wind-driven.

(Reproduced by permission from Paget's *Human Speech,* Harcourt, Brace and Company.)

SUMMARY OF TEN GESTURE WORDS, AND DR. WHYMANT'S SELECTION OF PROTO-POLYNESIAN AND ARCHAIC JAPANESE WORDS OF SIMILAR MEANING.

Meaning.	Pantomimic Gesture.	Phonetic Result.	Proto-Polynesian. Archaic Japanese.
Shake (like a mat)	Tongue shaken (behind the teeth)	**ɒlɑ-ɒlɑ**	**ore-ore** (Japanese). **ulia, urea.** Fijian. Hazlewood 142. **ruru-ruru,** Rapanni. East. Isld. 299.
Stab or spear	„ protruded between lips and teeth	**peð, pʌð,** or possibly **pʌl**	**bulu, mbulu** (Indonesian), Brandstetter. **mbale** (Fijian), Hazlewood 241. **pili** (Hawaiian) Pol. Wand. 289.
Shoot (with bow and arrow)	„ reflexed, grip at back of tongue, and sudden release	**ðr-ki, ðr-kui** or **dr-ki, dr-ku**	**koki, ikoki.** (The initial K representing a strongly reflexed R) Author. Cf. **çâri** (Skt.) arrow.
Pull down	„ reflexed and lowered	**trɑ, trɒ**	**ndrei** (Fijian), Hazlewood 30. **tore, ataru** (Japanese) Chamberlain and Ueda. Tr. Asiatic Soc. of Japan.

(Reproduced by permission from Paget's *Human Speech,* Harcourt, Brace and Company.)

The important elements in the oral gesture hypothesis are the pantomimes and gestures rather than the sounds. The sounds are significant only because specialized pantomime make it possible for the listener to distinguish between the sounds heard, and so to respond to them differentially. Voice itself is significant only because it serves the purpose of attracting attention to articulatory activity. Voice, *per se,* is merely emotional expression which requires movements of the organs of articulation for appropriate explanation. The changes in the attributes of sound – pitch, intensity, quality, and rate of utterance – of the speaking voice carry the emotional meanings, while the specialized pantomime of the mouth and tongue carry whatever intellectual messages accompany the emotional expression.

Two elements – intellect and emotion – are the constituents of speech. In general we believe that the more primitive the speaker, the greater the proportion of emotional content in his speech and the greater also the degree to which speech is being used purely for expression or communication of the speaker's thoughts or feelings. We will pursue this notion further in the next chapter. But before we do, we will consider another theory of the origin of speech and then take inventory of these various theories.

7. *Speech as a Social Enterprise.* This theory explains *why* rather than *how* man learned to speak. De Laguna,[9] a contemporary exponent of the theory, holds that speech is a "social enterprise" with an indispensably "social function."

> Men do not speak simply to relieve their feelings or to air their views but to awaken a response in their fellows and to influence their attitudes and acts. . . . Speech is

[9] G. A. de Laguna, *Speech: Its Function and Development* (Yale University Press, 1927), chap. I.

> the great medium through which human co-operation is brought about. It is the means by which the diverse activities of man are co-ordinated and correlated with each other for the attainment of common and reciprocal ends.[10]

Speech, then, is a stimulus used to provoke a response in other members of the group. The necessity for men to engage in collective action in hunting for food, and in their warring against predatory animals, demonstrated to them their need for a system of communication. Because men's hands were busy with tools, and because their desire to communicate persisted even when the object or recipient of speech was turned in another direction, the medium of communication had to have an aural appeal and be produced orally. De Laguna is chiefly interested in why rather than how man began to communicate orally. The assumption is made that when man wanted to communicate, his organism was ready to serve that function.

Summary of Theories as to the Origin of Speech

We shall attempt, by summarizing the more salient features of some of the theories presented, to arrive at an explanation of both why and how man learned to use the spoken word. Man learned to speak because he realized the need for speech, because the environment in which he found himself necessitated the use of speech. According to De Laguna, man, after his descent from the trees, found himself in an environment more hostile than before. He became a hunter through force of circumstances, and, because he was weaker than the animals he hunted for his food, he hunted in pack. To assist him in the hunt, and to protect his life, man needed a system of predication that

[10] *Ibid.*, p. 19.

could bring immediate reactions when he wished to warn, or direct, or otherwise communicate with his fellows. Fortunately man's mental as well as physical equipment was in a stage of evolutionary development. The frontal lobe of his brain had increased in size so that he had the wherewithal to think, to generalize, to learn as a result of experience. Man, in common with the lower animals, had a vocal apparatus which, like the lower animals, he used reflexively, as part of a total bodily response to a situation. But because man had more brain, he was able to make much of a happy accident – the oral production of a sound – and learned that he could gain conscious control over his vocal mechanism. So he began to manipulate his articulatory organs and to experiment with sound production. He maintained articulatory movements which resulted in easily produced sounds which brought him results in the form of responses from his fellows; he discarded movements which were of little use to him – those which brought him no responses from his fellows. Thus he evolved a spoken language.

PART II

BASIC PSYCHOLOGICAL ASPECTS OF SPEECH

CHAPTER THREE

THE NERVOUS MECHANISM AND SPEECH

The Mechanism of Speech

There is, of course, no special nervous mechanism that controls the production of speech. Neither is there a special mechanism which serves only the function of speech. In the process of evolution, the primary vocal organs developed in the first vertebrates that emerged from a water to a land habitat. With this emergence the gill respiratory mechanism lost its functional importance. Many of its parts were lost, but others remained and some were rearranged and modified into what finally became the primitive vocal mechanism to be found in such animals as the frog. This vocal mechanism further evolved and was elaborated, first in intimate relationship to the air-breathing organs of the higher vertebrates, and then in relationship to the digestive organs, as lips, mouth, teeth, tongue, palate, etc. Thus historically, we can see that the speech function was secondarily extended to organs whose primary biological relationships were with other organ systems.

Speech, in contradistinction to the mere production of vocalized sounds, presupposes a control of the organs involved by a nervous mechanism supreme in its modifiability. Were it not for his brain which developed so that it became peculiarly capable of learning and taking advantage of accidental occurrences such as sounds produced by digestive and respiratory organs, man, like his close kin the ape, would be able only to grunt, and he never could have achieved speech.

The present chapter will deal with two great systems that

make possible the complex correlation and interactions of parts of the body with each other and with the animal's environment. These systems are the nervous system and the endocrine system.

General Topography of the Nervous System

The nervous system can be considered in three main divisions: (1) The Central Nervous System (CNS), (2) the Cerebrospinal Nervous System, and (3) the Autonomic Nervous System (ANS). Because our purpose in this chapter is to emphasize functional relationships, we will combine our discussion of the cerebrospinal nerves with the CNS.

The Central Nervous System. We shall include in this discussion the brain enclosed and protected by the skull, the spinal cord extending down the back and covered by bony arches, and a series of cerebrospinal nerves which extend from the brain or spinal cord principally to the skin and voluntary muscles of the body.

An examination of Figure 1 will reveal that the anterior part of the brain is the cerebrum, which consists of two hemispheres, one on each side of the head. This is the largest part of the brain and is characterized by coarse folds and grooves which divide it into easily recognizable areas. Below, and partly covered over by the cerebrum, is the smaller, finely folded part of the brain called the cerebellum. Both the cerebrum and the cerebellum are connected by extensive columns of nervous tissue with more central masses constituting in part the brain stem. The posterior part of the brain stem is a somewhat flattened cone-shaped mass called the medulla oblongata. Through an opening in the base of the skull the medulla is continuous with the spinal cord.

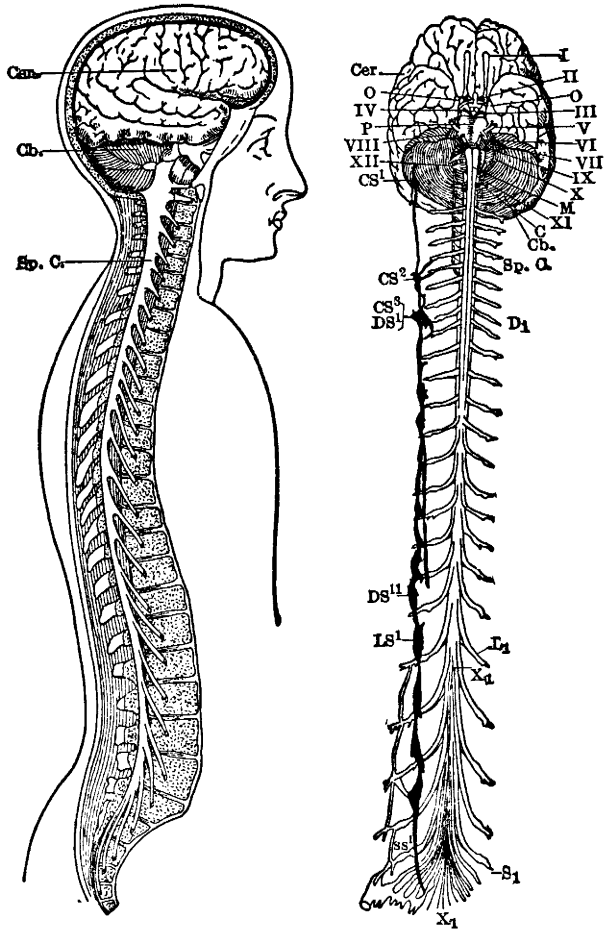


FIGURE 1. THE CENTRAL NERVOUS SYSTEM AS A WHOLE

On the left it is seen from the side in position in the vertebral column; on the right exposed and seen from the front. *Cer*, the cerebrum; *Cb*, the cerebellum; *M*, the medulla; *Sp. C*, the spinal cord. The 12 cranial nerves are designated by Roman numerals. The spinal nerves are designated in part: *C*, the first of the 8 cervical; D_1, the first of the 12 thoracic; L_1, the first of the 5 lumbar; S_1, the first of the 5 sacral; X_1 (lower figure), the coccygeal. Ganglia and connections of the autonomic division are shown in solid black; CS^1, CS^2, CS^3, superior, middle and inferior cervical ganglia; DS^1—DS^{11}, thoracic ganglia; LS^1, the first lumbar ganglion; SS^1, the sacral ganglion. (Reproduced by permission from J. F. Dashiell's *Fundamentals of Objective Psychology*, Houghton Mifflin Company.)

Fundamentally, all of these parts are built on the plan of a hollow cylinder enclosing a canal filled with fluid. In the spinal cord this canal is quite small, but as it extends through parts of the brain it is expanded into larger cavities called ventricles. The lateral (first and second) ventricles lie in the cerebral hemispheres and the third and fourth ventricles are in the brain stem region.

The peripheral nerves may arise either from the spinal cord or the brain. From the spinal cord thirty-one pairs of spinal nerves arise at regularly placed intervals, while from the brain twelve pairs of irregularly placed cranial nerves arise, mostly from the medulla. The spinal nerves are distributed fairly regularly to successively lower regions of the neck, trunk, and limbs. The cranial nerves are irregularly distributed over the head, and one, the tenth or vagus nerve, extends down the neck and into the chest and abdomen.

The Autonomic Nervous System. The autonomic nervous system consists of a complex of nerves extending throughout the body and connected at more centrally located masses called ganglia. Although we speak here of the autonomic nervous mechanism as a more or less separate system it is really structurally and functionally closely related to the CNS. In the thoracic and abdominal cavities the autonomic ganglia receive branches from the spinal nerves and constitute the subdivision of the autonomic nervous system called the sympathetic system. The tenth cranial nerve from the brain is intimately associated with a set of autonomic nerves which together constitute the parasympathetic system. The importance of these two subdivisions of the autonomic system is that they control the internal organs and other structures not under the control of the will. The actions of the sympathetic and parasympathetic systems are

generally opposed to one another; where one stimulates a set of organs, the other usually inhibits the same set. For example, the sympathetic system dilates the pupil of the eye, checks the flow of saliva, quickens the heart, and checks the movements of the stomach and intestines; the parasympathetic system, on the other hand, constricts the pupil, starts the flow of saliva, slows the heart, and increases the movements of stomach and intestines.

Neuro-Anatomy of the Nervous System. An understanding of the physiology of the nervous system calls for a consideration of the way in which nerve cells are constructed and interrelated. We will begin by a study of the neuron and its branches.

The Structure of the Neuron. Nervous tissue is composed of specialized cells known as neurons, built, with slight variations according to a common plan illustrated in Figure 2. Neurons are essentially threads of specialized protoplasm. A neuron consists of a cell body with branches called axons and dendrites. These branches may be of considerable length; in the peripheral nerves axons sometimes extend for several feet, but always are of microscopic fineness. Each neuron has a single axon with few end branches; the dendrites are more numerous and extensively branched and are generally shorter than axons. Many axons are covered by a fatty sheath which appears to insulate them somewhat as does the rubber covering around electric wires. Generally, axons run in bundles which in the periphery of the body constitute "a nerve" and which in the central nervous system constitute tracts. Each element of a bundle is called a nerve fiber.

The axon of the neuron breaks up into an end-brush of fine branches which interlace with the dendrites of another neuron or more directly envelop its cell body. This place of

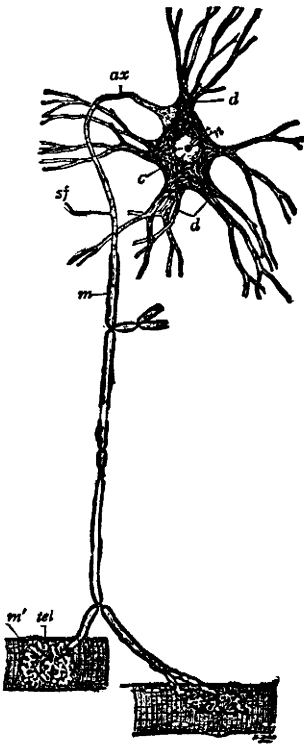


FIGURE 2. PRIMARY MOTOR NEURON (DIAGRAMMATIC):

ax, axon; *c*, cytoplasm; *d*, dendrites; *m*, myelin sheath; *m'*, striated muscles; *n*, nucleus; *sf*, collateral; *tel*, motor end-plate (Barker, Bailey). (Reproduced by permission from Bailey's *Histology*, Williams and Wilkins.)

junction at which the impulse passes from dendrite to axon is called the synapse.

INTER-CONNECTIONS OF NEURONS – REFLEX ARCS

Types of Neurons. A nerve fiber in a peripheral nerve may end either nakedly as in the skin, or else may make

contact with a sense organ from which it receives stimuli. In either case, such a fiber conducts impulses *toward* the central nervous system and is said to be *sensory* or *afferent* in character. A fiber which ends in contact with a muscle or gland which it stimulates into activity is said to be *motor* or *efferent* in character. Other fibers, known as *connectors,* serve the function of relaying impulses received by the sensory neurons to the motor neurons.

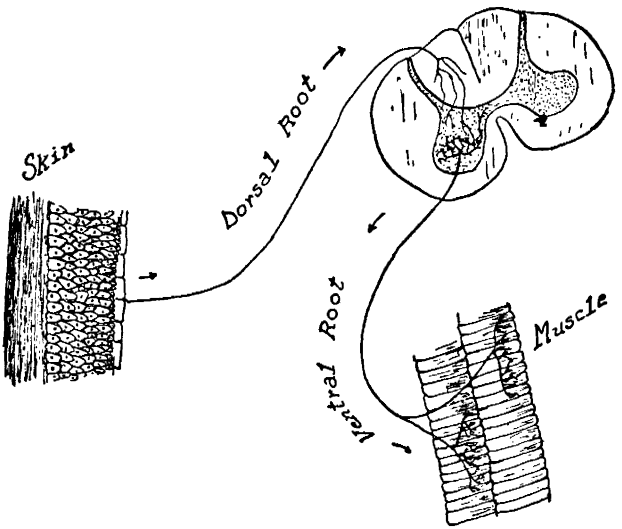


FIGURE 3. DIAGRAMMATIC REPRESENTATION OF A SIMPLE SPINAL REFLEX ARC. (After Herrick's *Introduction to Neurology.* Drawn by Lee Eisenson.)

Reflex Arcs. A sensory fiber conducts its impulse to the central nervous system where the impulse is passed through synapses to other neurons. It is theoretically possible that the impulse be transmitted directly to a motor neuron and thus be carried to some muscle or gland which it stimulates. It would then form a neuron pathway through the nervous

system that is called a *reflex arc.* A two-celled sensory-motor pathway would constitute the simplest possible reflex arc. (It should be noted that in the cerebro-spinal system synapses are made in the central nervous system whereas in the autonomic nervous system synapses may be made in ganglia as well.) It is probable, however, that no reflex arc is ever so simple in higher animals. The incoming impulse in higher animals passes to an intermediate (connector) neuron which then may distribute it to other such neurons or to motor neurons. Further, the single afferent fiber may have several branches, each going to another intermediate neuron; these in turn may make several additional contacts. It is obvious that such a system permits of a very complex distribution of a single impulse. It is in this very complexity of distribution and routing of impulses that the fundamental importance of the central nervous system appears. The central nervous system should be thought of as an intricate intercommunicating arrangement of neurons so laid out in pattern as to permit the most complex reflex arcs to be routed through it. Such arcs may serve to throw large muscle groups into activity as a result of local stimulation or, on the other hand, to permit the activation of a given muscle by stimuli applied to any one of several regions. Thus, while we may diagrammatically present a simplified reflex arc as in Figure 3, with only one intermediate neuron, it must be understood that such a presentation is purely a convenient simplification. In Figure 4 we have a diagrammatic representation of an actual reflex path. The real significance of the central nervous system lies in the fact that it makes possible much more complex interrelationships between stimulus and response.

The Spinal Cord and the Brain Stem. If we examine a section of the spinal cord we will find that the region

around the central canal is grayish in color, whereas the periphery is glistening white. The gray matter owes its appearance to the fact that its bulk is made up of cell bodies of the neurons and their dendrites. It is here that the synapses between neurons are made. In the white matter we find axons with their myelin sheaths that give the white appearance to the region. Here the axons course up and

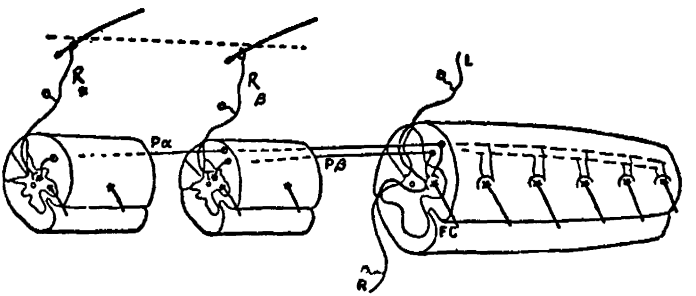


FIGURE 4. DIAGRAM OF THE SPINAL ARCS INVOLVED IN SCRATCH REFLEX (DOG).

L, receptive or afferent nerve-path from the left foot; R, receptive nerve-path from the opposite foot; Rα, Rβ, receptive nerve-paths from hairs in the dorsal skin of the left side; FC, the final common path, in this case the motor neuron to a flexor muscle of the hips; Pα, Pβ, proprio-spinal neurons. (Reproduced by permission from C. S. Sherrington's *The Integrative Action of the Nervous System*, Yale University Press.)

down the cord from one level to another and give off branches that enter the gray matter to make synapses.

In the brain stem we find a similar basic plan, except that here the greater importance of the sensory innervation from the eye and ear increases the complexity of the interconnections.

When we consider the extraordinary complexity of this system of millions of interconnected neurons, we are led to wonder not that a single stimulus can have such widespread effects, but rather that localization of effect is at

all possible, and that the motor effects of a stimulus can be integrated into a useful movement. For example, a slight scratching of a finger may result in a mere withdrawal of the hand but a sudden sharp pricking may induce the whole animal to jump away vigorously from the source of irritation. Apparently, the secret of this control over the nature and extent of reflexive activation lies in the nature of the synapse, which we shall now consider.

The Nature of the Synapse. Two physiological properties of the synapse enable us to understand nervous control. First, as we have noted before, the synapse is polarized. That is to say, it will *conduct only in one direction,* from axon to dendrite. This has been called the *law of forward direction.* Secondly, synapses have varied resistances. Thus, for a given afferent neuron there is a path of least resistance through the potential synapses. This would constitute the reflex aroused by a minimal stimulation. More vigorous stimulation may, however, enable the stimulus to spread to additional neurons and thus arouse a greater response. When an animal is poisoned by strychnine we find that the resistance of the synapse is greatly reduced, and the slightest stimulation is sufficient to throw the entire body into violent response. The whole process of the training of the neuron system seems to depend upon the fact that the more often a stimulus is routed through one pathway, the lower becomes the resistance of the synapses along this pathway and therefore the easier it becomes to arouse the particular reflex arc again.

Co-ordinating Centers

In our previous discussion we learned that the basic reflex pattern of the central nervous system is complex almost beyond comprehension. Yet the interconnections of neu-

rons are here more or less direct, involving the neurons that directly innervate the reacting system. Such neurons we may call the lower motor neurons. However, we find that superimposed upon these lower centers are higher centers of various degrees. These are to be found in the brain and serve to bring together stimuli from all parts of the body and to permit an organization of them into complex patterns that can then be sent to lower motor centers for proper distribution to muscles, glands, etc. Such higher centers constitute a complex hierarchy of control superimposed upon control. For example, a small object coming toward the eye may evoke only the simple localized reflex of winking, which would involve the lower neurons only. Were, however, the object a ball, a glass dish we valued, or even a child, how different our reactions would be! Especially so if the approaching object were accompanied by a cry of warning or advice. In such a case the visual and auditory stimuli passing to higher brain centers would be integrated in a more complex, and, we hope, a more intelligent response. It is not our purpose here to attempt any detailed presentation and analysis of the interconnections of these higher centers but rather to consider briefly the physiological aspects of some of the most important centers from the point of view of speech.

The Medulla Oblongata. As explained above, the medulla is the first part of the CNS above the spinal cord. Centers involved in life-maintaining functions are here localized. Afferent and efferent fibers from the tongue, pharynx, alimentary canal, the heart, and the lungs enter into and go out from the medulla. Of special interest is the respiratory center, which sends out the rhythmic stimuli that regulate breathing movements and modify the rate of respiration to the needs of the organism.

The Thalamus and Striate Bodies. In the center of the cranium and surrounded by the mass of tissue comprising the cerebrum are the thalamus and striate bodies. Impulses from all lower centers pass into this region and are here integrated. This integration seems to be on the lower psychic level of emotional response. Behavior dominated by the thalamus is characteristically violent and unrestrained. Crying, laughing, sneering, loving, and hating, with all the emotional color they lend to the voice, are basically thalamic activities.

The Hypothalamus. Situated directly beneath the thalamus is the hypothalamus. The centers for the control of the visceral organs involved in emotional responses are here localized. Hypothalamic control over the visceral organs in emotional responses is indirect. This control is effected through fibers interconnecting the CNS with the ANS. For example, in anger or rage, the overt response of sneering is the result of the impulses coming from the thalamus and striate bodies; changes in heart rate and blood pressure are the results of the activities of the hypothalamic centers acting through the ANS.

The Cerebellum. Though technically part of the brain stem, the cerebellum is functionally most complex. It receives impulses, particularly of muscle sense from lower centers in the brain stem and impulses from higher centers through its connection with the cerebral hemispheres. The most important function of the cerebellum is apparently to sort and arrange impulses from these sources and to correlate them in such a way as to permit control of precise muscular movements such as are necessary in the production of a smooth and even flow of speech sounds. Injury to the cerebellum is likely to result in a tremulous, jerky type of

muscular movement. In speech, such movements would result in a staccato, arhythmic output of sounds.

The Cerebrum. The cerebrum is said to be the crowning achievement of human evolution. It is the highest of the integrating centers as well as the largest part of the human brain. In the complex interrelationships of its billions of neurons lies the physical basis of man's consciousness and intelligence. Morphologically, we find here a reversal of the usual order in the neuron system, for the gray matter with its neurons and synapses is on the outer surface, and the white co-ordinating pathways lie beneath. This gray matter, referred to as the cortex, is increased in extent by folds called *gyri,* separated from each other by grooves or sulci.

Association and Projection Areas. Certain of the regions of the cortex receive fibers transmitted from lower centers that derive their impulses from individual sense organs such as the eye, the ear, etc. Such areas are referred to as projection areas. In Figure 5 the visual and auditory projection areas have been indicated. These areas serve for the integration and conscious interpretation of the stimuli received. The areas involved in the conscious control of muscular movements are located further forward, and behind these are sensory areas for corresponding regions. Surrounding these areas for some extent and occupying all of the anterior surface of the cortex are the so-called association areas. Here may be distinguished localized regions believed to have special significance for certain activities. Attention may be called particularly to Broca's area or the so-called speech area in the left lateral part of the cortex.

As we mentioned above, the functional importance of the cortex is that it receives impulses from all lower regions,

integrates them, and sends forth controlling impulses to lower motor centers. Such impulses may serve not only to stimulate lower centers to activity but frequently to inhibit activities which might otherwise be carried out by the lower centers. In general, then, sensory projection areas receive impulses from various sense organs of the body. But other besides sensory neurons are found in the projection areas. Association neurons are numerous. These serve to link

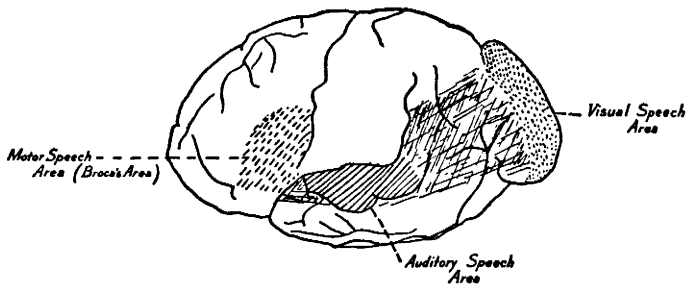


FIGURE 5. DIAGRAMMATIC VIEW OF THE LEFT SURFACE OF THE CEREBRAL HEMISPHERES SHOWING CORTICAL AREAS INVOLVED IN SPEECH. (Drawn by Lee Eisenson.)

the sensory neurons with each other and with other association neurons in the areas close to them. In the association areas the path of the impulse is further extended and complicated. It may be spread to still higher association centers where impulses from other sources combine with it. At any and all stages a linkage may be made between an association neuron and a motor neuron. The impulse will then be transmitted to a lower center in the brain stem or cord from which place contact is made with muscles. When such contact is made the muscles will be thrown into activity as a response to the received impulse. The importance of this concept of the shuttling, merging, and re-

arranging of impulses in the cortex is that it enables us better to appreciate the true nature of the cortical control of human behavior.

Certain reflexes, the winking reflex among them, and many of the fundamental elements of behavior, complicated though they may be, are entirely effected by sub-cortical centers. Such reflexes can be successfully carried out even though the cortex is eliminated. When a sensory projection area such as the visual area is destroyed, there is interference with sensory perception but not necessarily with reflexes dependent upon the stimulus. Destruction of the association area immediately around the visual projection area will result in errors in the evaluation of visual evidence. The interpretation of the form of objects or the judgment of their distance from the observer will not be possible. Destruction of more remote association areas may result in failure to make proper correlations between sight and other senses. For example, an inability to name objects seen may result. This, as we shall later learn, is characteristic of the amnesic form of aphasia.

Broca's Area and Speech. Speech represents one of the most complex of the activities of the nervous system. The production of speech involves delicate motor mechanisms and intricate correlations between and among all types of sensations. Much of the cerebral cortex is involved in the performance of a speech act. Yet it has long been customary to speak of a localized brain area (Broca's) for speech. Such localization of function in a strict sense is not really possible. What we mean by localization of function in the cortex for speech, or any other function, is that one type of correlation is effected more in a given area than others, and that the function dependent upon the correlation is the chief sufferer when there is any destruction in that area.

Thus, a lesion in almost any association area will affect the speech of a person, but lesions in Broca's area are most important because so many neurons found here are involved in the voluntary control of the speech mechanism.

Development of Behavior Patterns

According to the older neurological views, behavior was regarded as made up of the sum of localized, individualized reflexes. Complexity was attained by an increase in number of reflex arcs. Such a concept was consistent with the classical representation of the reflex arc. (See Figure 3.) We have, however, pointed out that this diagram of the reflex arc is a simplification to the point of falsification of the actual connections of neurons, and have offered a somewhat more appropriate diagram in Figure 4.

Progression from Mass Response to Individual Responses. The study of the development of behavior patterns in lower animals has shown the inadequacy of the concept of behavior as a sum of reflexes. Coghill,[1] who first studied the problem in a salamander, found that the earliest behavior shown by the animal involves not localized reflexes of a part of the organism but rather mass response of all the muscles functioning at the time. In a salamander this takes the form of a swimming movement. When the legs develop they first behave merely as part of this swimming movement of the entire trunk and only later does individualized control of the limb take place. Further, all parts of the limb respond together in the earlier stages and not until later are individualized movements of the forearm, fingers, etc., acquired. In neurological terms, stimuli tend to spread

[1] G. E. Coghill, *Anatomy and the Problem of Behavior* (Cambridge University Press, 1927).

throughout the nervous system according to a pattern related to the organism as a whole. Subsequently, pathways of progressively greater restriction appear individuated out of the mass pattern. Though it has not been possible to study the development of behavior in the human fetus in any such detail, the general result of the study of the development of behavior in the mammalian fetus and in the human infant has tended to confirm this interpretation of progressive restriction and consequent individuation.

Determinants of Individuation. The factors that actually determine differentiation of response are not definitely known. We do know that there is a relationship between the degree of myelination of the neurons and the development of reflex activities. Whether this relationship is one of causation or merely of concomitance has not been determined. We know that there is reflex behavior in the fetus before any myelination has taken place. Yet complex behavior seems to develop only in connection with myelination of appropriate tracts.

Differentiation Applied to Development Stages of Speech. The first movements of the infant involve mass activity of the muscles of the body. Among the muscles which are thrown into play are those of speech, with the production of vocalized sound in the form of undifferentiated crying resulting as a by-product of the mass movement. Differentiated crying does not begin until the infant is a few weeks old. During the first few weeks it may be observed that mass movements are appearing with less frequency. In place of these, specific responses appear. Lalling and babbling which follow are further results of differentiated though still reflexive behavior. During this time myelination of neurons is taking place. When the infant reaches the echolalic and voluntary utterance levels, he has reached a

developmental stage where rather finely differentiated muscular responses can be made. In general, precision in articulation is positively correlated with differentiation of responses, and with neuron myelination.

The Endocrine System

The activities of the organism are adjusted to meet the demands of the environment and the needs of internal integration partly by the nervous mechanism which was just described and partly by the functioning of a set of glands which produce specific regulatory chemicals. These glands, whose chemical products are known as hormones, constitute the endocrine system. Hormones are generally passed directly into the blood stream, by means of which they are diffused throughout the entire body. Because of the diffusion of hormones, the activities of many different and divergently placed organs may be integrated into unified responses.

The Relationship of the Endocrine System to the Nervous System. In its relationship to the nervous mechanism the endocrine system must not be thought of as an entirely distinct mechanism. In fact, modern research has shown that far from being a different mechanism, the nervous system, particularly the autonomic, may act upon the tissues of the body by producing chemical substances which serve as the immediate stimuli to the tissues. For example, sympathetic nerves generally produce a substance called *sympathin* and parasympathetic nerves usually produce the chemical *acetylcholine*. Some authorities are of the opinion that all passages of impulses across synapses are mediated by such chemical substances. The action of such "nerve hormones" is largely limited to the immediate neighbor-

hood of the fibers which produce them. Thus, in their manner of action, the endocrine system and the nervous system may have much in common.

We should not consider the activities of the two great correlating systems as essentially duplications of each other, because there is a characteristic difference in the kind of correlation carried on by each. The nervous system is the mechanism permitting immediate, rapid, and localized response; the endocrine system, on the other hand, characteristically controls the long-time, long-range responses that are involved in the "set" of the organism toward general or cyclic changes in the environment. This difference is very well illustrated in the first of the endocrine glands to be considered.

The Adrenal Medulla. The *adrenal glands* are located just above the kidney in the abdominal cavity. Both their central or *medulla* region and their outer or *cortex* portion are glands of internal secretion. The cortex will be discussed later. The medulla produces a substance called *adrenalin* or *epinephrin* which has an action on body tissues like that of sympathin, produced by the sympathetic nerves. It accelerates the heart, raises blood pressure, induces a release of sugar from the liver into the blood, inhibits the action of the gut, and has many other activities. According to Professor Cannon, these effects are not haphazard phenomena; each contributes in its own way to adapt the animal for quick effective action in an emergency. In short, this emergency theory supposes that the activities of the adrenal medulla serve to tone up the organism for a struggle. The adrenal medulla becomes active more slowly than the sympathetic nerves which it simulates, but its action lasts much longer. Thus, many of the body reactions in fear, rage, or other violent emotional states tend to be

supported and maintained by the activity of the adrenal medulla.

The Thyroid Gland. This gland is situated at the base of the neck where its pathological enlargement is responsible for *goiter.* It manufactures an iodine-containing hormone called *thyroxin.* This chemical speeds up the general metabolic activities of all the cells of the organism. Thus, a person with an overactive thyroid may become excessively restive and irritable, and lose weight because of the excess cellular activity induced. In the opposite condition, a fat, lethargic person may develop. In the growing child, the thyroid gland is of special significance, for a deficiency during childhood leads to retardation in physical and mental development, and may result in a condition called *cretinism.* The speech of a *cretin* is characteristically thick and lacking in precision; the rate of utterance is slow; pitch and inflectional changes are childish and immature.

The Parathyroids. These tiny glands near or in the thyroid gland are extremely important because their hormone regulates the concentration of calcium in the blood. This element is in turn vital for the maintenance of the proper degree of irritability in the nervous and muscular systems. Deficiency in the parathyroids leads to a condition of extreme irritability, muscular tension, and sometimes tetanic seizures.

Sex Glands. Besides producing sex cells – the *gametes* proper to each sex – the sex glands also produce hormones which help to induce both the structural and behavioristic responses necessary in reproduction. The male gland *testis* produces a hormone which promotes the development of the secondary sex characteristics including male sex behavior. The *ovary* produces at least two hormones which work similarly for the female. The characteristic changes

in the male larynx at puberty which so profoundly affect the voice of the boy are a result of the activity of the testis. Other changes of a physiological nature are more or less directly related to the activities of the sex glands.

The Pituitary Gland or the Hypophysis. This gland is located in a little bony pocket, the pituitary fossa, under the brain in the center of the skull. It is often appropriately termed the master gland because it produces a variety of hormones that serve to control the activities of most of the other endocrine glands. For example, it regulates the thyroid by one hormone, the adrenal cortex and parathyroids by others, and the sex glands by several others. From the behavioristic point of view, one of the most interesting products of the pituitary gland is *prolactin,* which induces not only the physical development in the mother necessary for nursing the child but appears likewise to be largely responsible for that psychological "set" which we recognize as the maternal instinct. The tenderness of the mother with her young, and her fierce boldness in their defense are conditioned by the prolactin produced by the pituitary. It is probably only while the pituitary is producing this substance that the "female of the species is more deadly than the male."

Another of the important hormones produced by the pituitary gland is the growth-promoting substance. Excess of this hormone leads to greatly increased growth which in the adult may result in bony distortions of the face; the mandible becomes disproportionately enlarged thus interfering with articulation in speech.

Other Glands. There are a number of other known endocrine glands which are of lesser significance from our point of view because their activities and their relation to behavior are not so readily traceable as those of the glands

we have discussed. Their activities are concerned with body chemistry and their effects on behavior are not easily discernible. We will discuss these glands more briefly.

The Adrenal Cortex. The hormone of this gland is indispensable for life although the exact mode of its action is still uncertain.

Pancreatic Islands. These islands of cells in the pancreas produce the hormone *insulin* which is necessary for the proper metabolism of sugars and fats by the body. In this function it co-operates with the hormone of the pituitary. An absence of insulin results in the disease called *diabetes mellitus.*

Other tissues of the body may also produce hormones. Hormone production by the nervous system has already been discussed. The digestive tract correlates a number of its processes by means of hormones. Again, glands like the *thymus* and *pineal* have often been suspected of being endocrine in function, but the evidence for this view is not clear.

CHAPTER FOUR

EMOTION AND SPEECH

Our task of determining the role of emotion in speech would be considerably lightened if we were able, at the very outset, to define the term *emotion*. Unfortunately, there is much disagreement among psychologists as to the precise nature of this phenomenon. We shall, therefore, try to steer a safe course by first examining the general concepts of emotion and then endeavoring to arrive at an understanding, if not a definition, of emotional states.

General Concepts in Regard to Emotions. 1. Emotions are diffused and massive. In an emotional state the entire organism of an individual is involved. It is, in this respect, much like a feeling. Emotions differ from feelings, however, in that they are more definite, especially on the motor side. An emotion is at once a sensation mass *and* a motor set. Thus, *fear* is a complex of the sensations experienced in a frightening situation, plus a motor set for *escaping* from the situation that gave rise to the emotion.

2. Emotions present a general physiological picture differing very little in fear, anger, or excitement.[1] In each there is disturbed glandular and muscular activity with adrenalin the principal agent in the disturbance. But emotion is more than a mere glandular and muscular disturbance; it is also a conscious state, an awareness of disturbance in a given situation. The runner getting set for a race and during the race is in an organic state comparable to that of the man fleeing from danger, but the runner is not conscious of fear, nor does his running constitute flight.

[1] C. W. Lomas, "The Psychology of Stage Fright," *Quarterly Journal of Speech*, XXIII (1937), 35–44.

We might say that the runner is overtly simulating an emotion, without being involved in a true emotional state. For a real emotion we must have a reason, a situation for which the emotion is a motor set. The presence of a situation not only makes for real emotion but permits the observer to differentiate and determine the particular emotion being experienced by the performer. Knowing the behavior situation, the external observer has little difficulty in identifying an emotion. Thus, despite the similarity in physiological changes, we know that fear is an emotional response to danger, and anger to frustration or interference.

3. In general, the physiological changes that occur during emotions are of such nature as to aid the body in the efficient use of muscles and to increase available energy. Cannon and Britton say:

> The essentials of the theory were that the changes wrought in the organism at critical moments – the shifts in the circulating blood, the hyperglycemia, the dilated bronchioles, the more rapid heart beat, the flush of adrenalin – were favorable to highest efficiency in supreme muscular activity. . . . According to the evidence now in hand, the greater the emergency, as measured by the intensity of excitement and struggle, the more is that mechanism utilized.[2]

4. Emotional responses are controlled, in so far as they may be said to have control, on a subcortical level, most probably, according to Cannon and his associates, in the thalamus. Bard [3] found that decorticate cats exhibit a tendency to react excessively. He says: ". . . release from

[2] W. B. Cannon and S. W. Britton, "Studies on the Conditions of Activity in Endocrine Glands," No. 20, *American Journal of Physiology*, LXXIX (1926–1927), 433–465.

[3] P. Bard, "A Diencephalic Mechanism for the Expression of Rage," *American Journal of Physiology*, LXXXIV (1928), 490–513.

corticate control must be the chief if not the sole factor in producing the tendency to react excessively."

5. Emotions are featured, primarily, by disorganization of response. Responses become random, excessive, and largely useless, both overtly and verbally. Dockeray, in discussing the general, disorganized nature of emotional response, says:

> . . . emotion may be considered the opposite of attentive or organized behavior. There are segments of the total behavior which are largely organized, such as certain glandular and visceral reactions; but the total picture is that of disorganization.[4]

This last aspect of emotion is perhaps of greatest importance for students of speech. In the state of disorganization, and consequent reorganization, the laryngeal and respiratory tracts become intricately involved. Because of this, speech frequently becomes an important and decisive index of emotional state. Emotional states are revealed in speech.

The Revelation of Emotions. We might, before we proceed further, pause to consider how emotions are revealed. Are emotional expressions innate or learned, or are they both at once, in the sense of being modified innate expressions? Darwin contended that innate expressions which accompany emotions are probably survivals of acts that were once of practical value in the life of the individual or the race. Thus, head shaking arises from the infant's rather violent movements in rejecting food. Expressive movements in laughing and crying probably begin as unlearned. However, the infant probably soon learns that

[4] F. C. Dockeray, "Emotions as Disorganized Response," *Psychological Bulletin*, XXX (1933), 620.

certain cries are more efficacious than others, and these tend to become strengthened and fixed. Thus, infants learn to cry in characteristic manners. Certainly there are acceptable and tabooed ways of smiling, and laughing, depending upon the given situation. "Finishing schools" emphasize training in the "proper" way to smile and laugh as an important part of their work. Expressive movements, in general, tend to become reduced as the individual becomes older. If there are any original, native movements in emotional expression, modifications tend to standardize them, so that with maturity the adult learns a language of emotions, composed of standardized gestures and bodily movements, involving the face, the hands, and the body as a whole, and used either alone or together with inflected, verbalized symbols. Each individual finds emotional language in use, and learns to appropriate it, modifying it according to the peculiarities of his own personality.

Emotion and the Spoken Word. We are about ready to apply what we know about emotional states – which we may now define as behavior patterns involving profound and general reflexive bodily activity brought about by specific situations – to the problems of speech.

Emotion and the Reorganization of Behavior Patterns. In our discussion of the origin of speech, we have indicated that vocalized speech arose as a by-product of the emotional expression of primitive man. Vocalization, as such, served merely as an expression of emotion. The voice attracted the attention of the listener to the speaker. Voice in itself conveyed only the crude idea of a broad emotional state. For an explanation of the emotion, primitive man had to use pantomime. At first it was total bodily pantomime; later it was reduced to tongue pantomime or articulation. The listener or observer reacted at once to both the vocali-

zation and the articulation, to the emotion and the explanation, or, we might say, to the emotional and ideational content of speech. What was true of primitive man's first utterances we will later see to pertain also to the speech of the infant. The first infant sounds are reflexive, total bodily reactions. They indicate only the existence of broad emotional states. The utterances of the infant continue to remain reflexive and emotional until the infant's nervous system has matured to such a degree that differentiation of response becomes possible. With maturation and possible differentiation of response the human being is able to organize his reactions to meet specific situations. Because situations tend to recur, in whole or in part, in human experience, the individual eventually is able to develop patterns for meeting the recurring situations. Fortunately for the human animal, the patterns are not rigidly fixed and unchanging as they are with lower animals. Patterns of conduct undergo modification varying in degree according to the situation met. Identical situations, if we admit for the sake of argument that any two situations can ever be identical, can be met with the same behavior pattern. Slightly varying situations call for a small degree of modification; a situation greatly at variance requires a great degree of pattern modification. But what does the human animal do when he faces a new situation, one for which he has no established behavior pattern? Obviously, he must organize one to meet the new situation. His organization will, of necessity, depend upon already established patterns of behavior. He must begin with what he has, which is to say, what he is, and reorganize himself. In the state of reorganization he once more becomes essentially an emotional animal. Because emotional behavior is total and reflexive and involves the laryngeal and respiratory mecha-

nisms, speech often becomes a clear index of emotional state.

Emotional Behavior and Primitive Speech. One of the fundamental characteristics of primitive speech is its high emotional content. Both the gesture symbols and the vocal symbols which, as we earlier pointed out, are related to the gestures (see p. 10), appear to be more direct responses to experiences in terms of emotion than more civilized speech. Can the high emotional content of primitive speech be explained in terms of reorganization of pattern responses? Primitive man lived in a relatively simple environment in which he could get along with a comparatively small number of pattern responses. In his own environment, then, there was no cause for the normal adult primitive man to be especially emotional when he spoke. But the very simplicity of his environment, with its limited opportunities for experiences, made it likely that he would respond emotionally the moment he was faced with a new situation. If, for instance, our primitive ancestors wandered from their native homes to distant places where they saw new vegetation or new animals, they would perforce react emotionally to the change in the environment. The small child of civilization who strays too far from his home likewise responds emotionally, usually by crying, to new streets and unfamiliar faces. The more limited an individual's opportunities for experiences the greater the likelihood that he will respond emotionally in the face of new situations. Primitive man's simple environment did not afford him opportunities for rich and varied experiences. Hence, though his speech was probably not particularly emotional when it pertained to concepts within his native environment, experiences which were infrequent and unusual

brought forth emotional reactions which were reflected in his speech.

Emotional Behavior and Infant Speech. The infant is much like the primitive man in that his environment for a long time is very limited. New experiences are more numerous and occur more frequently for the infant than for the normal civilized adult. The infant, then, must undergo a change of behavior pattern each time he is faced with a new experience. Therefore emotional behavior in speech is the rule rather than the exception. As the normal infant matures, the need for complete change of behavior patterns becomes less frequent, and emotional expression diminishes in both intensity and frequency.

Emotion and Crystallization of Habit. Zipf in discussing emotion says:

> As we proceed from the less complex to the more complex in the totality of our being, emotion is emitted. The more rapidly and the more extensively the change takes place, the more intense is the concomitant emotion. Without change in organization, there is no emotion; without emotion, no change. . . . This progression in animate behavior from the less complex, less crystallized in habit and less patterned, to the more complex, more crystallized, and more patterned consists in redistribution and rearrangement. . . . The greater the degree of distribution involved, the greater the attendant intensity of emotion.[5]

Human beings in their behavior are ever tending toward crystallization of habit, but at the same time are seeking to avoid complete crystallization. All learning is in effect an establishing of behavior patterns to meet situations. The ultimate achievement in learning would be an establish-

[5] G. K. Zipf, *Psycho-Biology of Language* (Houghton Mifflin Company, 1935), p. 207 f.

ment of a repertoire of behavior patterns to meet every situation. Fortunately for the race, this cannot be attained. Such attainment would bring with it complete monotony and an absence of emotional activity. On the other hand, complete diversification (all elements in a situation new) would result in a condition of emotional instability, for then the individual would have no pattern of behavior to meet any situation. Neither extreme of complete crystallization or complete diversification can ever be found in actual human experience because all situations are variations and rearrangements of other, previously experienced situations. Human beings, in general, strive for a state between the extremes, a state in which are preserved enough of the established behavior patterns to prevent extreme diversification and emotional instability, and sufficient variety is introduced to prevent monotony. This tendency may be found in all normal speaking and hearing situations. In any normal speaker-hearer situations, the speaker is confronted with the task of supplying the listener with sufficient diversification to maintain the listener's attention, and yet not so much as to make the listener unable to follow the discussion. The listener's reactions affect the speaker. If the listener attends, it is an indication that the amount of variation introduced by the speaker is "right" and in effect serves as a reward for the speaker who continues along the lines he began. For successful speech the speaker's discourse must have an amount and rate of variation equivalent to the listener's adjustment ability.

Emotional Intensity and Intellectual Content. In the language of the highly excited, typified in its most extreme form in the manic, we have pertinent evidence as to what happens to the intellectual and articulate content of speech under the influence of heightened emotion. The speech of

a highly excited person has little intellectual content of any importance. Many words are said, but often the language is indistinct and incoherent. It is well-nigh impossible to follow the trend of thought, the articulated meaning, in the speech of an agitated person. Emotional intensity, however, is readily indicated. The speech is vivid, but unprecise, indefinite, and poorly articulated. Emotional and feelingful speech in general is much more striking for its vividness than for its clarity and logical (intellectual) content. Slang words, terms of abuse, and curses – an integral part of the (not necessarily spoken!) speech of most normal persons – further exemplify the vividness and intensity, and the indefiniteness of meaning, of impassioned speech. The literal content of such slang expressions as *the cat's pajamas, boloney, the horse's neck* is not in any case to be taken seriously. What does matter is the vocal intensity and inflection in which these terms are said. Terms of endearment are equally lacking in logic, but are no less effective for it. The French *mon petit chou* which, translated literally, means "my little cabbage," is hardly a flattering term, but the Frenchman uses it nevertheless with apparently successful results. The American's use of the term *angel* to name the person of his heart's desire, is not, even by the Freudians, considered to be a wish-fulfilling announcement! We expect to be pardoned if we do not enter into a discussion of the potent Anglo-Saxon words which have come down into modern English as terms of abuse.

The speech of the extremely sad or obsessed person, on the other hand, as typified in its extreme form by the depressive, is marked by over-articulatedness and a lack of vividness. The speaker presents the same thoughts again and again. Often, at least from the point of view of the

listener, the inconsequential and the important are offered by the speaker with the same stress, and with the same intensity, or lack of it. Normal persons, when tired or sad, present similar speech pictures. Diversification of content is very low, the voice is monotonous and weak, and one idea usually dominates the content of the speech. Attempts on the part of the listener to change the content are of no avail. Change takes place only when the speaker changes and ceases to be tired, or depressed, or obsessed. This implies a reorganization of behavior patterns. During the process of reorganization emotion is again expressed and revealed through speech.

CHAPTER FIVE

THE PSYCHOLOGY OF LEARNING AS APPLIED TO SPEECH

Basic Principles in the Psychology of Learning

The Unit of Behavior. The smallest psychological event of behavior with which we can deal is the Stimulus-Response (S→R) unit. Examples of such behavior units involving a sensory stimulation and a consequent response are: approach of moving objects to eye – closing of eye; touching of hot object with hand – quick removal of hand from object. All reactions of animals are to *stimuli,* which may be defined as physical forces capable of calling forth reactions. A stimulus, to be adequate, must be capable of calling forth a reaction. Animals respond only to adequate stimuli; unstimulated responses are inconceivable.

We recognize of course, that the notion of a simple stimulus causing a simple response is no more than a convenient abstraction. In actual human behavior an individual is never confronted by a single stimulus to which he makes a single response. Stimuli occur in situations which are highly complex and evoke multiple responses. When we are hungry the presence of food causes visual, olfactory, gustatory, glandular, and kinesthetic responses. Food is not a single stimulus but a multiple stimulus calling forth multiple responses.

Set or Attitude in Determining Responses. The response that is called forth in a situation depends upon the condition of the reacting organism and the nature of the situation. The entire past history of the individual up to and

including the moment of his responding affects his reaction. As Thorndike points out:

> The situation "a certain printed word" has different effects upon learning, according as the child in question is bent upon reading or spelling; the figures $\frac{247}{126}$ obviously determine learning differently according as the pupil is predisposed to copy, to add, to subtract, or to multiply; the same hand provokes one response at cribbage and another at whist.[1]

Learning as a Function of Reward. The basic principle of learning in Connectionist [2] psychology is that learning is a function of reward. To fixate a connection readily it should be rewarded. Let us review the classical experiment of the cat in the puzzle-box. A cat was placed in a box and the door of the box closed. The cat, a good experimental subject, sought a means of escape immediately upon being incarcerated. The cat was a naive subject and so did not know that only by touching a latch could she affect her release. So, in cat fashion, she scratched all over the box until finally and purely by accident she touched the latch which effected her release. Upon release the cat was given a piece of fish. The fish constituted the reward for the cat's efforts. But the poor cat was not done with her trials and tribulations. Again she was placed in the puzzle-box, and again she scratched, and once more she won her short-lived freedom. The second release was effected in a shorter time than the first. But the cat was further plagued with incarceration. Not until she learned to touch the latch without previous exploration and so immediately to release herself

[1] E. L. Thorndike, *Educational Psychology, Briefer Course* (Bureau of Publications, Teachers College, 1927), p. 144.

[2] Connectionism may be characterized as the selection of responses to fit a situation.

was she permitted to go her own way. Before the experimenter was through with the cat she had learned to form the connection: touching latch→freedom→food (fish).

The cat-in-the-puzzle-box experiment calls for the formation of a single connection, a very simple learning performance. We may, however, combine associations into a series which the animal can learn, though the learning will proceed more slowly and a greater number of trials will be required before the entire act is learned. Thorndike placed a chick in a pen from which the chick was able to escape by climbing up an inclined plane. When the chick had learned to do this, a second pen was placed next to the first, cutting off escape until the chick learned that he could win his freedom by creeping through a hole on one side of the second pen. After several trials the chick learned to climb up the plane in the first pen and to go through the hole in the second in order to gain his freedom. Then a third pen was added, with several blind alleys and a thoroughfare. The chick now had to learn a series of associations in which the satisfactory completion of one brought him to a second and new situation, to which he had to respond before arriving at the third and final situation. An association chain of this sort can be lengthened and made increasingly complex so that it begins to approach the complexity of human acts.

The Spread-Effect of Reward as Demonstrated in Experiments With Human Beings. Now, let us leave the lower animals and pay some attention to human beings and their labors in learning. We will examine a comparatively simple human learning experiment. It is our desire in this experiment to have an individual connect a given word with a number in such a way that every time he hears the word he associates the same number with it (e. g., dog→2). We set up the experiment for which these were the directions:

> I am going to read a series of forty words. Each word has one number from one to five which we will consider correct for that one word. All other numbers are wrong for that word. If the number you announce is correct, I will say "Right." If the number is not correct, I may say "Wrong." At the outset you will not know which number is correct for each word. Guess! We will go through the series five times to give you a chance to learn to make the correct associations.[3]

In this experiment the word *Right* was considered the reward and *Wrong* the punishment. The human beings upheld the standards established by the cat and the chick in the other experiments. The rewarded connections were learned more quickly and maintained for a longer period of time than either the punished connections or the connections neither rewarded nor punished. Oddly enough, some of the punished associations were remembered and maintained. The results of the experiment show that rewarding a connection (establishing a satisfying state of affairs immediately upon the completion of a connection) strengthened it; punishing a connection weakened it little or not at all. The satisfyingness which follows immediately upon the completion of a connection may be compared to a stream of strengthening which is poured down upon the connection to which it belongs. But the stream of satisfyingness overflows the specified, intended connection, and spreads to earlier and later connections and to more loosely attached connections. To state it somewhat differently, satisfyingness may be considered as arousing a unit of strengthening which is directed in general toward the connection to which it "belongs," but which sometimes hits an earlier or a later connection, or an attached accessory con-

[3] J. Eisenson, "Confirmation and Information in Rewards and Punishment," *Archives of Psychology*, 181 (1935).

nection. Thus, in a series of S→R situations, one of which is followed by a satisfying after-effect, the influence of satisfyingness is likely to attach itself most to the connection which it immediately follows, and to influence that connection for a longer period of time. The state of satisfyingness, as we indicated, may attach itself to neighboring connections with which it is not logically concerned. The following set-up of S→R situations illustrate the point:

$S_1 \rightarrow R_1 \rightarrow A_1$
$S_2 \rightarrow R_2 \rightarrow A_2$
$S_3 \rightarrow R_3 \rightarrow A_3$ (Reward)
$S_4 \rightarrow R_4 \rightarrow A_4$
$S_5 \rightarrow R_5 \rightarrow A_5$

$S_3 \rightarrow R_3 \rightarrow A_3$ is the rewarded connection, and so is the most likely to be strengthened; but $S_2 \rightarrow R_2 \rightarrow A_2$ and $S_4 \rightarrow R_4 \rightarrow A_4$ also are found to gain strength because of their proximity to the rewarded connection. $S_1 \rightarrow R_1 \rightarrow A_1$ and $S_5 \rightarrow R_5 \rightarrow A_5$ also gain in strength, but not as much as the connections $S_2 \rightarrow R_2 \rightarrow A_2$ and $S_4 \rightarrow R_4 \rightarrow A_4$, which are nearer to the rewarded connection. The effect of a reward in this series of connections was originally compared to a stream of strengthening. Perhaps it would be more apt to compare the reward effect (satisfyingness) with heat radiation, which permeates and affects most intensely objects nearest to its source, but which passes beyond them and warms other objects until it is used up. The further an object is from the source of radiation, the smaller is the amount of observable effect.

Influence of the Spread-Effect of Reward in Human Learning. The "spread-effect" of the influence of a reward may be a power for both good and evil in learning. When rewards are used expertly in teaching, learning can be

made pleasant and easy. When rewards operate without control, they can help produce learning that is often useless, and sometimes wholly undesirable. We learn to misspell words, or to memorize a telephone number in the wrong sequence, and we learn countless misinformation because of the operation of the influence of rewards whose existence we may not even suspect. We learn, much to our future woe, how to speak defectively, to lisp, to talk "baby talk" and possibly even to stutter because of the subversive influence of rewards. Just how that takes place we will save for a later time when we discuss speech disorders common to children and present an example of a learned disorder (dysphonia). (See pages 141–142.)

Associative Shifting.[4] Associative shifting is a special type of Stimulus→Response learning. Essentially, in this type of learning, a response originally connected with a given situation is to be elicited even though the initial situation is not present in its entirety. Schematically, we can represent the learning task thus: A (a given situation)→X (a reaction to the situation). A new element, B, is added to the original situation but the same response is desired: (A + B→X). Now, however, we wish to elicit the response X whenever the new element B appears: (B→X). When this is accomplished we have a completed associational shift; the individual reacts to B as he originally did to A and mediately to A + B. What takes place in associative shifting is that the new element in the situation at first becomes identified with the original situation and ultimately serves as a substitute for the original situation.

[4] The terms *conditioning* and *conditioning of responses* are used by many psychologists, especially of the Behavioristic school, where we use *associative shifting.*

Summary of the Analysis of the Psychology of Learning

1. A motivated organism makes random, exploratory reactions when confronted with a situation to which it is expected to adjust. One reaction, or a chain of reactions, may be successful in effecting adjustment. When this reaction or reaction chain becomes attached to a situation we have a completed behavior unit (S→R). With further trials, the repeated R's tend to become "stamped in" and other R's, which originally may have been made to the S, eliminated. We may say that the learned performance involves a selection of one of many earlier responses to a given situation.

2. The given R becomes associated with the S because of the pleasurable after-effect either derived from or associated with the successful completion of the connection.

3. Although the influence of the satisfyingness of a connection is most likely to become attached to the connection which it immediately follows, it may also attach itself to neighboring connections with which it is not logically concerned. This is known as the *spread-effect of reward.*

4. Responses may become attached not only to original situations with which they were connected, but also to new elements which have become associated with original situations. When a new element is able to call forth the response made to the original situation, we have a case of *associative shifting.*

The Psychology of Learning Applied to Speech

How Primitive Man Learned to Speak. When primitive man grunted while pantomiming with his tongue, lips, and jaw he produced an audible gesture that resulted in the

development of speech. This was possible only because he had an audience, someone or ones before whom he might grunt and pantomime, someone or ones who rewarded him for his vocalized gestures. The reward, in the instance of the first of our ancestors who grunted and pantomimed, probably came in the form of more immediate and complete attention than he had hitherto been accustomed to receiving. Added satisfaction came when man was able to bring attention to himself in the dark, or when his audience was for some other reason not in view. The original situation was undoubtedly all a happy accident, but one that was likely to take place.

How the Infant Learns to Speak.[5] The happy accident is repeated when the infant begins to learn to speak. The birth cry, the first human sound made with the speech mechanism, is followed by much adult activity, which, were the infant in condition to know it, would be ample reward for his efforts. The infant of two or three weeks "knows" that crying brings results. He has already learned the bond S→R→A. In his case it is Irritant→Cry→Satisfaction by relief of irritant, or else Need (Hunger)→Cry→Satisfaction of need (Food).

Speech, no matter what its nature, whether simple or complex, is always a process of stimulation and response, a process in which bonds or connections are formed through the functioning of rewards. Most frequently the rewards come from an outside source, from the mother, for example, in the case of the crying child. But this need not always be. The completion of an act itself may serve as sufficient reward. This is very likely the case with the infant who is in the lalling stage. (By lallation is meant a repetition of

[5] A more detailed discussion of the development of infant speech will be presented in chapter VIII, pp. 113–123.

sounds.) The first step in lallation is the reflexive production of a sound in the process of vocal play. The second step consists of hearing a particular sound. The third step consists in the infant's reproducing those sounds which are pleasant to his own hearing. A successful reproduction becomes an added source of pleasure, and serves as stimulus (incentive) for another repetition.

So, we have the connection chain: Reflexive sound (stimulus)→Hearing (response)→Pleasure in Hearing (reward) which in turn serves as a stimulus which results in repetition (response).

The learning of the first word by the infant proceeds along the same lines. The sound complex *ma* [mɑ] appears early in the child's linguistic development. The sound complex, a combination of a bilabial and a vowel which is close phonetically to the vowel sound heard in the infant's first cry, may be heard as soon as the infant begins to babble. In the lalling stage it is likely to appear as a duplicated sound – *ma-ma*. But *ma-ma,* the sound complex, is not *mama,* the word naming the infant's female parent. The sound complex and the word begin to be one and the same only after the mother appears on hearing the child vocalize *ma-ma*. The appearance of the mother, who is generally associated in the infant's mind with the satisfaction of his many needs, is a source of pleasure. The mother probably repeats the child's vocalization which is in turn repeated by the child, each successful repetition functioning as a reward, and strengthening the connection. If the mother continues to appear whenever the child vocalizes *ma-ma,* the sound complex will change to a word. The word is learned on the same basis as the imitated sound complex during lallation (Stimulus→Response→Reward).

CHAPTER SIX

THE PSYCHOLOGY OF MEANING

Meaning and Sense-Perception

A complex of noises strikes the ear, and we say that we hear a child crying; we see a pattern of lines on a paper, and we say that we see a box; our visual senses are stimulated by a red figure on a green background, and we say that we see a cherry. We are illustrating in these instances the phenomenon called *sense-perception,* which we may define as the interpretation of sensory stimuli. Sense-perception is attaching meaning to stimuli.

Signs in Perception. Often the situations which we perceive are not present in their entirety but are merely indicated.

> We may have before the eyes simply a *sign* of some fact, but perceive the fact which is the *meaning* of the sign. We look out of the window and "see it is wet today," though wetness is something to be felt and not seen. What we see is some sign of wetness. We use many similar expressions which are absurd if taken literally. We "hear the street car," though a street car is not a noise, and we say that a stone "looks heavy," or that the jar of fruit "smells sour." Thus one sense affords signs of facts that could only be really experienced by another sense.[1]

In the cases cited above the reactions that took place were to incomplete stimuli or to reduced cues or signs which stood for the complete stimulus situations. The acquisition of meanings is essentially a process through which signs

[1] R. S. Woodworth, *Psychology* (Henry Holt and Co., 1930), p. 394.

come to stand for complete situations, and in which reactions are made to signs in terms of the situations for which they stand.

Symbolic Cues (Words). In the sign situations presented above reactions were made to incomplete stimuli which were originally part of complex stimulus situations. Difficult as this process may be, other animals besides man are capable of learning to react in this manner. Man's perceptual superiority lies in the fact that he can learn to respond to stimuli which are not reduced cues of original stimuli, but to substitute stimuli which are entirely different in nature from the original for which they stand. When a person is responding to a *word* he is not responding to a reduced stimulus of which the given word was a part, but to something which has entirely different attributes. Man is superior to lower animals because he is better able to use symbols, because he can deal with signs which stand for things. Word signs have become man's most common means of intercommunication.

The Acquisition of Meanings

Associative Shifting. The process through which meanings are acquired, from the point of view of the psychology of learning, is basically one of associative shifting. Essentially, we recall, in this form of learning, a response originally connected with a given situation is to be elicited whenever a stimulus associated with the original situation is presented. Schematically: $A \rightarrow X$, $A + B \rightarrow X$, $B \rightarrow X$.

Factors that Determine the Manner of Perceiving. We must keep in mind also that an individual's response to any situation is dependent upon many factors, his desires, his

purpose, his interests, and his motives. His entire past experience influences his reaction to any situation. Because no two individuals are alike, because the extremely delicate and complex systems of connections are peculiarly different for each speaker and for each hearer, there is never any certainty that any two people will react identically to the same situation. In fact, the situation is never the same for any two individuals, or for any one individual at any two different times. The number of meanings any situation may have to one person cannot be determined unless we can determine experimentally all the organized responses a given situation can call forth. (If you wish to know all the possible meanings of a word, try to imagine all the possible ways of reacting to it. In how many ways can you react to the word *water?*) The immediate past of an individual, his activities just before meeting a situation, are potent factors in determining his reactions to that situation. For instance, a person's ability to comprehend a given passage in a book depends upon his reading of the sentences that led up to the particular passage. To take another example, we drop a letter into the first mailbox we pass or continue on, depending upon whether we have stuck a stamp onto the envelope, or must yet secure the stamp. The sight of the mailbox to the man carrying the letter ready to be mailed sets off a series of responses such as walking to the box, pulling down the metal flap, and dropping the letter into the box. To one with an unstamped letter it may make no special impression and cause no special reaction, or may cause the person to make a mental note of the location of the box for possible future use.

Words acquire meanings when the individual has learned to react to them as he originally did to the thing or situation for which the words stand—when words have references

attached to them through the process of associative shifting. Now, it is clear that many references may be attached to the same word so that a given word symbol stands not for one thing but for several possible things. The references, it is apparent, may vary widely from individual to individual, and the meanings vary accordingly. When words are uttered in isolation it is not easily possible to determine what the speaker wishes to convey by his words; misunderstandings are likely to arise unless the situations in which the words are uttered limit and control their possible meanings. But words are not frequently used in isolation; more usually they are used in context, as part of a total pattern. In a contextual pattern the meanings of words are limited and become definite. We shall now analyze the factors which limit and determine the meanings of words.

Determinants of Word Meanings

1. *The Referent.* To be able to determine the meaning of a word we must be able to define its "referent," the "particular action, or object, or relation between actions or objects, or characteristic of those actions, objects, or relations, for which the word stands." [2] The word, we remember, is a sign or substitute stimulus or response which has no intrinsic meaning of its own. The meaning of a word depends upon the associations or experiences for which the word is a sign or substitute and for which, therefore, the word stands. Sound combinations which of themselves have no meanings come to have meanings when through associations they come to stand for something.

2. *Common Reference.* It is obviously not enough for

[2] G. W. Gray and C. M. Wise, *The Bases of Speech* (Harper and Brothers, 1934), chapter VI.

words to have meanings for the speaker only. To be of use in communication words must have common meanings for the members of the group. Community of reference is possible because individuals in a group tend to participate in the same activities and to have substantially the same experiences. Common references arise out of common experiences; communication is possible only in so far as words have common references. We must not assume, however, that community of reference implies identity of meanings. Because the apperceptive mass – the body of the individual's experiences and memories – is different for each person, identity of meanings is not possible. Fortunately, identity of meaning is not necessary for ordinary communication. We get along with our neighbors by understanding the approximate meanings of the words they use. We never completely understand what we hear; the degree of understanding is determined by the similarity of past experiences between speaker and listener in regard to the words used.

3. *Verbal Context.* What any one word means is determined in part by its relationship to the other words with which it occurs. Words may be said to have denotative or dictionary meanings and connotative or contextual meanings. But even the dictionary is likely to list more than one meaning for all but highly technical words. For example, the word *fire* as a verb has many denotative meanings among which are the following: to set on fire or affect by fire; to explode or discharge (as firearms); to illuminate or to shine; and, colloquially, to dismiss from a job. The particular meaning which the speaker has in mind is generally clear enough when the word is used in context. Certainly few employees ever imagine that they are to be used in place of powder or fuel when they are to be "fired."

Homonyms, words phonetically alike but which have different meanings, would seem, offhand, to be potential sources of trouble. Several examples of homonyms are: *no* and *know; to, too,* and *two; for* and *four; eight* and *ate.* We expect no trouble when we read homonyms in context because the differences in spelling restrict the meanings. In audible speech, however, the ear cannot detect spelling differences. Yet we seldom misinterpret *ate* for *eight* or *no* for *know.* As in the case of the word *fire,* we understand the meaning of the word because of its place in the contextual pattern. Words spoken in isolation may have so many possible meanings that, for practical considerations, they become meaningless. In context, however, we can usually readily define the referents of words and so limit their meanings.

It is pertinent at this point to ask how any one phonetic configuration may come to acquire more than one meaning. How, for example, does the word *gas* come to mean gasoline at one time, illuminating gas at another, and nitrous oxide at still another? In each case *gas* is either an abbreviation or a substitute for a longer term; an abbreviation for *gasoline* and *illuminating gas,* and a substitute for *nitrous oxide.* The shortening of a word makes for convenience of use, it saves time and energy. The process of decreasing the magnitude of a word occurs whenever any term is used frequently.[8] Since the same abbreviation may be used for at least three terms in the instance of the word *gas,* why, then, is there no confusion as to the meaning of the word? Why is there no real danger of the dentist's administering gasoline to the patient when he requests that

[8] This principle will be treated in some detail in a later section. See pages 82–88.

his tooth be extracted under gas? Why does the automobile service station attendant know that the driver wants a petroleum product and not nitrous oxide when the driver stops his car and asks for five gallons of gas? There is no confusion in meaning – with its possible disastrous results – because the different groups using the term are, for the most part, mutually exclusive. On those occasions when a member of one group becomes temporarily a member of another, as in the case of the filling station attendant making a professional call on his dentist, the special circumstances surrounding the occasion make misunderstanding of homonymous terms very unlikely. The dentist at the filling station is not likely to want to purchase nitrous oxide, nor is the filling station employee likely to go to a dentist in order to purchase fuel for his automobile.

4. *Manner of Utterance.* The way in which a word is spoken determines, in part, the meaning of the word. Inflectional changes, changes in intensity, the rate of utterance, all may considerably affect the meaning of the word. Inflectional changes are of special importance because they may completely alter word connotations. *No,* spoken with an upward glide in pitch may be used to connote "yes"; while *yes,* uttered with an upward glide, may be used to connote the negative. When words are spoken in context a change of inflection, intensity, or rate may completely alter the meaning not only of the particular word but of the entire context.

5. *Personal Attitude.* The feeling of the individual speaker about what he is saying is important in determining the meaning of the words spoken. If we realize that a speaker is angry or annoyed, we are in a better position to understand the full import of the words we hear.

Graff explains the ontogeny of meaning along similar lines. According to Graff,[4] "meaning is a phenomenon cognate to sign situations and their interpretations." This calls for interpretation on our part. A sign is defined as a "stimulus similar to some part of an original stimulus and sufficient to call up an engram formed by that stimulus." An engram is a "residual trace left as the result of the excitation by an original stimulus." But signs or stimuli do not occur alone, they occur in context.

> 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 character and related by the same relation; and these occur uniformly. . . . Such a context is external if the entities are stimuli; it is psychological if the entities are engrams. . . . To interpret a sign means that an engram, members of a psychological context, is called up by a stimulus similar to some part of the original stimulus. 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 relative. Any experience can thus be interpreted and have meaning.

Graff's explanation can readily and fortunately be translated into terms of connectionist psychology. Such translation brings us right back to the series of formulae for associative shifting ($A \rightarrow X$; $A + B \rightarrow X$; $B \rightarrow X$). B is the sign, "the stimulus associated with or related to some part of the original stimulus." B derives its feeling of similarity, or perhaps we should rather say familarity, through association with the original stimulus (A). If the relationship between A and B is evident the occurrence of B will recall

[4] W. L. Graff, *Language and Languages* (D. Appleton–Century Co., 1932), pp. 78–79.

A, and the individual will react to the situation as he formerly did when A and B occurred together. Ultimately, the occurrence of B will bring about an immediate reaction such as was originally made to A + B, without any recall of A. When this takes place the associative shift is complete, or in other words, B has assumed the same meaning for the individual as did the original combination A + B. Let us illustrate this by a child's learning the word *daddy*. The infant sees his paternal parent daily but has no name for him. His father may be associated with many things in the infant's mind, such as walking the floor in the small hours of the night, or playing, or midnight bottle-feeding. To these associations and relationships (A) the infant reacts in a certain way, whatever that may be. The formula thus far is A→X, X standing for the reactions brought about by A. Now, if the word *daddy* is said every time the father comes into the child's presence we will have the second step in associative shifting: A + B→X. The child, we should note, is reacting to A with some awareness of the existence of B. Finally, the word *daddy* alone will bring forth the reaction from the child that he originally made to A and then to A + B. The associated shift is complete, the word *daddy* now brings about the original reaction. B→X has become essentially equivalent to A→X.

The acquisition of meanings is no different from learning in general. Essentially, it is a matter of forming bonds or relationships. These bonds are strengthened through the influence of rewards. Whether the rewards are self-imposed or come from an outside source depends upon the particular learning situation. Often the successful establishment of the bond serves as sufficient reward, especially with adult learners.

Psychological Factors Determining Choice of Words

The Webster Unabridged Dictionary contains more than a half million words; the Funk and Wagnalls *Desk Standard Dictionary* contains about 83,000 words; and dictionaries which one many purchase at ten-cent stores contain about 25,000 words, but the average adult *writing* vocabulary consists of approximately 2,500 words. And the speaking vocabulary of the average adult is appreciably smaller. What are the psychological factors which determine an individual's selection of words for his own use out of the many thousands of words he may possibly use? The factors determining such selection are ultimate in causing lexicographers to list certain dictionary words as obsolete, and in causing other words to be omitted from smaller dictionaries. The words actually used by one generation of people are basically the ones the next generation will use. We who today use the words determine what part of our language is to be bequeathed to posterity as vital and potent.

Satisfaction to Speaker. The primary factor in determining an individual's choice of words is the degree to which the use of a word will bring about the desired results. If our wish is to communicate or stir up ideas in others we would tend to use those words which, from our past experience, we know have succeeded in communicating or stirring up ideas. If we are merely playing with words for the pleasure of vocal play, we will tend to use those words or types of words which in the past have afforded us the greatest amount of pleasure. If our desire is to use words as a social gesture, the current *hello* or *so long* type of words or phrase will be used. The choice of words is fundamentally determined by the purpose of our speech and our knowledge of

the ability of the chosen words to fulfill the particular speech purpose. But there are other factors which now, as in the past, play an important role in a person's selection of words for his own use from the vast number which he hears and sees. These factors we shall now consider.

Ease of Pronunciation. Most of us will agree that we are more likely to use words which are easy to pronounce than words which, for some reason, are difficult for us. A very important factor making for ease of pronunciation is the magnitude or length of the word. Words may consist of single sounds or phonemes such as the indefinite article *a,* or they may consist of a number of different sounds or phonemes uttered in a continuous stream of speech, such as in the word *heterogeneous.* Obviously, shorter words are more easily pronounced than longer words and so are favored in the process of selection.

The Relationship between Word Magnitude and Frequency of Occurrence. Do words occur often because they are short, or does the frequency of occurrence of words tend to make them short? Words, it must be remembered, are tools of speech, and the function of speech is to call forth responses from the listener. The potency of a word in bringing about the desired reaction will therefore be a primary determinant in its selection for use. What, then, is the relationship between the potency of a word, its frequency of usage, and its length or magnitude? Does the shortness of a word make it potent; does the potency of a word tend to make it short; or is there a tendency to change the structure of words in the direction of shortening those words which speakers find most useful?

Let us first consider the possibility that the original shortness of a word makes it a potent and useful tool, and so, because of its small magnitude, the word comes into frequent

and current use. If this were so we should find that those words in our language which were originally short should today be those most frequently used. It will help us in our search for such evidence to examine the Thorndike *Word Book*. The revised edition of the *Word Book*[5] contains a list of the twenty thousand words which were most frequently found in the general reading material intended for children and young people. The words are listed alphabetically with notational symbols to indicate their order of frequency of occurrence. No evidence that the shortness of a word in and of itself is a cause of frequent usage is to be found here. The words *pyre* and *pyx* are among the nineteenth thousand, *adobe* is among the twentieth thousand, *abet* is among the seventeenth thousand, and the lowly *pun* among the thirteenth thousand in frequency of usage. Certainly, if the shortness of the word determines the frequency of usage, one-syllable words such as *pyx* and *pyre* would be included among the first rather than among the nineteenth thousand. *Adobe* contains but three syllables when correctly pronounced, but it is listed among the twentieth thousand, whereas *accompany,* which contains four syllables, is listed among the second thousand; *able* is no longer than *abet* but *able* is among the first thousand. Still, if we take a random sample[6] of ten words each from the first and twentieth thousand of the Thorndike list the difference in length of words will be readily noticed. The words *a, able, about, above, account, across, act, add, afraid,* and *after,* are among the first thousand words. The mean syllable length of these ten words is 1.7 compared with 3.6, the mean syllable length of the ten words, *abnegation,*

[5] E. L. Thorndike, *Teachers' Word Book of 20,000 Words* (Bureau of Publications, Teachers College, 1932).

[6] The words are the first ten in alphabetic order among the first thousand.

abscond, acclimatize, acetanilid, acquisitive, acrobat, acrobatic, adobe, adorable, and *adroitness,* chosen at random from words among the twentieth thousand.

Let us now consider the other possibility: Do words decrease in magnitude because, to begin with, they are such potent tools and such useful instruments in aiding the speaker to bring about desired reactions, that they become commonly and frequently used? In brief, does usefulness of a word make for high frequency of usage, and does high frequency of usage in turn result in a decrease in the magnitude of a word?

Zipf believes that long words tend to become short with frequency of usage. He says, "There are copious examples of a decrease in magnitude of a word which results, as far as one can judge, solely from an increase in the relative frequency of its occurrence, as estimated either from the speech of an individual in which the shortening may occur, or in the language of a minor group, or of the major speech group." [7] There are two types of shortenings or abbreviations, both of which we will consider: (1) truncations and (2) substitutions.

Truncations. A truncation of a long word takes place whenever an object, or act, or relationship, or one situation occurs so often in the experience of a speech community that the word that names it comes into frequent use. The obvious reason for this abbreviation is to save time and energy. For example, *omnibus, telephone, automobile,* and *talking pictures* have been truncated to *bus, phone, auto,* and *talkies.* These shortenings occur because of the prevalence of these mechanical contrivances, and the resultant frequent reference to them. On the other hand, long words such as *vivisection* and *legalistic* are not shortened because

[7] G. K. Zipf, *Psycho-Biology of Language,* p. 29.

they are rather uncommon in occurrence. An interesting special aspect of this type of word abbreviation is the influence upon truncations of small speech groups within the larger group. The term *amps,* as a truncation of *amperes,* is in frequent usage only among electricians and physicists. *Amps* is coming into common usage because of its relatively high frequency of occurrence among those individuals who do use the term. These individual members of a special speech community carry the truncated word into the larger speech community of which they are also members. Many people in the larger speech community will probably never hear anything but the shortened form of the original word *amperes.* So we see that a word which may occur only rarely in a large speech group may still become truncated because of its high frequency of occurrence in a special speech group. If we consider such words from the viewpoint of the vocabulary of a large community the word appears short, but from the viewpoint of the small, special speech group the words are, because of their high frequency of occurrence, justifiably short.

Abbreviatory Substitution. The second type of word shortening is that of abbreviatory substitution. This is merely the substitution of shorter words for longer words such as *car* for *automobile, call* for *telephone,* and *wire* for *telegram.* It may be of interest to note that two of the examples just cited have each a truncation as well as an abbreviatory substitution, in the terms *auto* and *phone.* These are examples of relatively universal and stable abbreviations. But not all abbreviations are quite so universal and stable. As with truncations, abbreviatory substitution may occur within minor groups within a larger speech community. Trade and professional jargons give us interesting examples of substitution in words such as *soup* for *nitro-*

glycerin, juice for *electricity,* and *prexy* for *president* of a college or university.

Temporary Abbreviatory Substitutions. The most common abbreviatory substitutions are of the type we are probably not even aware of making. We refer to the highly temporary use of pronouns for nouns, adverbs for adverbial phrases, etc. When we say, "Tuesday was a lovely day, it was clear and warm," *it* is in reality a short word temporarily substituted for *Tuesday,* a longer word. There is, of course, no need to continue presenting examples of this type of abbreviation. *It* cannot become a permanent abbreviation for Tuesday because in another sentence such as "It is his book," *it* refers to something else. Unstable abbreviations have no permanent effect in regard to altering the vocabulary of a language.

Summary. We may summarize this discussion by the generalizations that: (1) The magnitude of a word varies inversely, though not necessarily proportionately, to the relative frequency of its use; and (2) As the relative frequency of a word increases, its length decreases.

Forces Preventing Word Shortening. Before leaving this subject, let us see whether there are any opposing forces which might tend to make speakers use words less frequently than they otherwise might, and so perhaps impede the abbreviation process. We must remember that, in general, a speaker is led to modify sounds, words, and locutions toward ease and brevity, subject to control by his successes and failures in producing the desired responses in hearers and in avoiding shame and ridicule. In any given speech situation there will always be special determining factors that will govern the use of specific words. A long word may be purposely chosen instead of a short one in order to avoid

the dangers of monotonous repetition. Sometimes the speaker will use a long synonym for a short word he has already used in order to flatter the listener, or perhaps even to bolster up his own ego with a "mouthful" of verbosity. A speaker who sees that he is getting the desired reaction from his listener with long words will be influenced, whether he knows it or not, to continue using long words. A simple person may use long words because of a possible fear of insulting his listener by the use of words of lesser magnitude, even though the speaker may himself habitually use the shorter words. Essentially, the words chosen for any one speech situation are those which, regardless of their magnitude, produce the greatest amount of satisfaction for the speaker. This tends to prevent too frequent repetition of the same sound, word, or locution, and so may impede the process of word abbreviation.

Still another force which prevents too frequent use of words is that exercised by social taboos and proprieties. For example, the short English word *whore* is considered improper and is not used in polite society; the longer term *prostitute* is a socially acceptable substitute for it. "Obscene" terms and terms whose meanings are connected with physiological functions are deemed improper and not to be used in the best circles. When people find it necessary to express such meanings they resort to circumlocutions and euphemisms.

Superstition plays a role in preventing the too frequent use of some of the words. Many parents of infants will not speak or name directly diseases which are common to young children. Bloomfield points out that "In some communities one avoids the names of game animals, either during the hunt or more generally. Under special conditions (as, on

the war-path), many speech forms may be avoided, or *inverted* speech, saying the opposite of what one means, may be in order." [8]

We see, then, that there are forces which prevent too frequent use of the same words. If all speakers were free of these forces, and if the expression of meaning were the sole determinant in the choice of words, the process of word shortening would be considerably accelerated.

[8] L. Bloomfield, *Language*, pp. 155–156.

CHAPTER SEVEN

SPEECH AND THOUGHT

Earlier in this volume we characterized speech as man's method of eliciting responses from others without resorting to agencies extraneous to his own organism. We also presented, as an important type of situation in which the spoken word is used, the one wherein the speaker who is the source of stimulation, is himself the reactor to the stimuli. Now, as a matter of fact, every time speech is used by an individual with the intention of causing responses in others the individual himself reacts to the words he uses. If this were not true, speakers would never spontaneously correct themselves while engaged in discourse. We know, of course, that they do. In this section we are concerned with those situations in which speech is used primarily to cause responses in the user, that is to say, we are interested in the problem of *thought.*

THE MATERIALS OF SPEECH AND THOUGHT

The Concept. The elements of speech, we have learned earlier (see pages 9–10), are pantomime and gesture, words and voice. The significance of these elements is in their sign value, their capability of calling forth something, an object, a quality, a feeling, or a relationship for which the sign stands. Sapir points out that single speech forms (words) are symbols of concepts, "a convenient capsule of thought that embraces thousands of distinct experiences and that is ready to take in thousands more." [1] He defines thought as "the highest latent or potential content of speech, the con-

[1] E. Sapir, *Language* (Harcourt, Brace and Co., 1921), p. 12.

tent that is obtained by interpreting each of the elements in the flow of language as possessed of its very fullest conceptual value." [2] We think, then, in terms of symbols, symbols which represent concepts. Our thinking is such stuff as our concepts – which constitute the ideas we have of things – are made of.

The symbols with which we think are those which are most appropriate and most familiar to us in a given situation. Because words – the tools with which we can communicate thoughts to others – are most familiar to us, we generally think in words. But often we use special sets of symbols or words for special types of thinking. For example, many American students who study medicine abroad think medically in terms of the language in which they are trained in medicine, but in English about matters concerning their homes. Linguists may learn to think in any one of the several languages they know, depending upon the particular situation which stimulates them to thought. But thinking may also be done in a less common and more highly specialized system of symbolization. The mathematician may do a considerable amount of his thinking in terms of mathematical symbols; a musician may think in terms of musical notations, and a painter in terms of colors and lines. The particular system of symbolization used in the thought process is determined by the circumstances and the situation in which the thinking is taking place. No matter what the system of symbolization, each symbol represents a concept. Now let us turn our attention to the study of the nature and development of concepts.

The Nature of Concepts. Our concepts of things are what the things – persons, objects, relationships, qualities – mean to us. Concepts may be said to represent the highest de-

[2] *Ibid.*, p. 14.

veloped form of meaning. They are highest in the intellectual hierarchy which begins with sensation and includes percepts, images, and concepts. Let us review briefly the nature of the constituents of this hierarchy.

1. The *sensation* is usually thought of as a single element, unless it is a sensation complex. A sensation is a direct response of an organism to a sensory stimulus. When we use the term *sensation* we usually mean the mental processes aroused when sense organs are stimulated. Through these processes we receive information regarding the qualities of objects or the condition of our bodies. If, for example, an orange is the stimulus, the qualities obtained from such a stimulus may include color (orange), roundness, weight, temperature (coldness), etc. Objects stimulating the body may result in sensations of pressure (pain), temperature (heat, warmth, cold) strain, etc.

2. *Percepts* may be characterized as interpreted sensations and perception as the process through which sensations become meaningful. Percepts are more complex in nature than sensations; they are made up usually of sensation complexes, which are interpreted in the light of the experience (the apperceptive mass) of the reactor. Percepts give us knowledge of the presence of external objects. Except perhaps in controlled psychological experimentation our simplest sensory experiences are percepts rather than sensations. Only when we analyze our percepts do we note qualities. We perceive an orange as an object, not as a sum of different and detached qualities.

3. *Images* are reproductions of past experiences in the form of either memory or imagination. Images, unlike percepts, have no objective existence. They are mental pictures and represent our consciousness of objects, qualities, or conditions which are not actually present to the senses.

We may classify images into two types: those of imagination and those of memory. Though *images of imagination,* like all images, are derived from experience, they do not correspond to any previous percepts or experiences. Images of imagination represent new forms and combinations of old concepts. A griffin, for example, is a combination of lion and eagle. *Memory images,* unlike the images of imagination, are rather accurate reproductions of some perceptions, imaginations, feelings, etc., which have occurred in the past experiences of the individual. Memory images, however, are less vivid than the original perceptions. For example, our recollection of a landscape is not as vivid and distinct as the actual perception of the landscape.

4. *Concepts* are based on word images which give us knowledge of essential elements, relations, or classes of objects. Though our concepts depend upon our motor responses and our memory images they are more than mere combinations of motor responses and memory images. Concepts are rather a sum total effect remaining with us as a result of our experiences in dealing with things. We may tentatively characterize concepts as generalizations which contain only elements which are essential and constant. The elements which are included in a concept are related and linked together by our recollected observations that they belong to the object, person, event, relationship, etc. How conceptual elements are related and generalizations are formulated will be better understood if we study the development of concepts in the child.

The Development of Concepts in the Child

Egocentric Nature of Early Concepts. Although true conceptual development does not take place until the child

begins to talk and acquire names for things, crude and rudimentary concepts may be observed to begin earlier. We may say that as soon as a child begins to anticipate what a person or object can do to him and reacts in the light of the anticipated stimulus, he really has formed rudimentary concepts of that class of persons or objects. For example, the child who reaches out when he sees his mother enter his room indicates, or at least the adult so believes, that he is expecting to be picked up by his mother, and so has formed a conception (limited in extent) of his mother. Similarly, the child who throws his plate on the floor and closes his eyes indicates that he knows something about the nature of plates – that they break with a crash – and thus has some concept of plate. The small child by his anticipatory behavior reveals that some facts observed about the same object have been linked together and related, and that he has formed a concept out of this relationship. The child's concepts are egocentric; they center about what he does to objects and what the objects do to him. Not until he learns to talk can his concepts include relationships outside of himself. When he talks and understands language, he may include in his concepts experiences which other people have had directly with objects and of which he has been told. But such widening of concepts is not likely to take place for a long time after the child begins to understand speech and to speak himself.

We see, then, that the child's early concepts are definitely egocentric in nature. All objects about which he has concepts are somehow related to him as an individual. He defines objects in terms of how *he* uses them or what *he* does to them or *they* to *him*. For example, a child of four or five may define a chair as "to sit on," a doll "to play with," a table "to eat on," and mother "to feed me."

The egocentric nature of children's concepts is further revealed in their animistic view of objects in their environment. At first, all things which surround men are conceived of as man-made. When the child observes the moon move with him when he walks, he concludes that it is *his* walking that *makes the moon walk,* and when the child stands still and observes that the moon has paused, it is *his* standing still that has made the moon stop moving. To the child such an explanation is most simple and practical. He observes that things move with him and concludes that they move because of him. He finds it difficult to go beyond himself in forming his conceptions of things in his environment.

Not until the child through force of circumstances is compelled to observe that objects in his environment may be related to others besides himself does he begin to form more objective concepts. When the child learns that there are things he may not touch but which others may handle, and that things may have one relationship to him but another to other persons or objects, he begins to have more objective conceptions. For example, the child is early made to realize that the baby in the crib may not be touched by him though he may speak to it, but that the baby may be handled by his mother. The baby then is conceived of in a twofold relationship: that which *he* has to it and that which *his mother* has to it. When a ball which the small child uses merely for throwing is bounced by his older brother, a broadened, less egocentric concept of *ball* begins to take form.

Factors of Advantage in Concept Formation

In the early development of the child's concepts two factors of advantage are of great importance: "What stands

out in sense perception has the advantage in concept formation, and what the child deals with in a motor or practical way has the advantage." [8]

Because of these two factors of advantage the child's early concepts consist for the most part of names of things and people and of action words. Persons and things surround the child and they stand out clearly from their surroundings. People move and most objects can be made to move so that the child can readily differentiate and isolate them from their backgrounds. Furthermore, the names of persons and things in the child's environment are frequently mentioned so that he is readily able to associate particular names with different persons and objects. Nouns and verbs are the earliest forms of speech to appear in the child's vocabulary and together they constitute an average of almost 64% of the vocabulary of the eighteen-month-old child, and about 46% of the vocabulary of the forty-month-old child. (See table page 130.)

Generalizing Concepts. When a child calls every man *daddy* or every woman *mama,* he is generalizing. His generalization is based on his reacting alike to things which are in some important respect alike. When a new stimulus or situation is essentially similar to an old stimulus or situation, he will tend to react to the new as he has to the old. Thus, though a child has played with one particular ball, he calls all objects similar to this by the name *ball.* For a time oranges and apples will be called *ball.* However, when the child begins to eat oranges and apples but is not permitted to chew balls, or finds balls unpalatable if he attempts to eat them, a second and very important step in the formation of true concepts – analysis – takes place. Not all round objects, the child discovers, are balls. A ball is round,

[8] R. S. Woodworth, *Psychology,* p. 455.

but other objects which are not balls may also be round. The child must now isolate features essential to one class of objects from features present in this class but also present in another class of objects. Concomitant features which vary from one particular class of objects to another must be ruled out. Only the essential, non-varying features must be considered in the formation of a true concept. So, finally, a child may learn that his "daddy" is not just a man, but a man with a specific set of features which characterize him. On the other hand, a child learns that there are many sizes and shapes of tables, having varying and non-stable features, but that all objects bearing certain essential features are to be included in the concept *table*. The features common and essential to all tables will appear more frequently than the less common, non-essential features. The common, stable features will finally determine the child's learning of the concept.

Perhaps the process of the formation of objective concepts will be better understood by a tabular presentation. Let us suppose that the child is forming the concept *cat*. The child in his experience is likely to come into contact and react to many cats, as well as to have many cats react to him. We will present the possible results (interactions) of several meetings between the child and several cats.

(1) Child sees cat and observes:	cat has white fur, four legs, whiskers, tail (which child pulls), causing cat to claw at him and cry "meow."
(2) Child sees cat and observes:	cat has black fur, has whiskers, four legs (and claws on feet), has tail,

	and cries "meow" when tail is pulled.
(3) Child sees cat and observes:	cat has red fur, has whiskers, four legs (and claws on feet), has tail, and cries "meow" even though tail is not pulled.
(4) Child sees *picture* of cat and observes:	cat has brown fur, whiskers, four legs, claws on feet, tail, and is told by companion, "The cat says 'meow.' "

Now, let us sum up the child's observations in regard to cats. He observed that a cat may have any of several colors. (The specific color frequency in the hypothetical series we presented was never more than one.) He further observed that:

All the cats had whiskers – frequency 4.

All the cats had four legs – frequency 4.

All the cats had claws – frequency 4.

All the cats had tails – frequency 4.

All the cats either cried "meow" (3) or could cry "meow" when properly stimulated, or were spoken of as saying "meow" (1).

From the point of view of frequency of occurrence the characteristics *fur, four legs, whiskers, claws,* and *the cry "meow"* were reacted to most often. Because of the frequency of occurrence of these characteristics they come to be included in the child's formation of the concept *cat.*

But other animals, such as dogs, the child may observe, also have *claws* and *four legs,* but are not cats. These con-

comitant features are ruled out by the child as the essential determinants of *cat*. *Whiskers* and *meow* are peculiar to cats, and these, as far as the child has observed, are not characteristic of other animals. These stable, unvarying features ultimately enable the child to separate cats from other classes of animals and thus become the basis of a true concept. We may now analyze the formation of concepts into these steps:

1. Subjective conception based on child's generalization determined by his direct experience with object.
2. Inclusion of experiences of others.
3. Isolation of characteristics peculiar to given class of objects and ruling out of concomitant features present in more than one class of objects.

As a result of this process, which may go on consciously with the help of a teacher or unconsciously and without outside help, the generalization will contain only those elements which are related and linked together through recollected observation. The residual effect of the observations in regard to a class of objects will be the resultant concept of that class of objects.

The Learning Process in Concept Formation. The learning process in concept formation is essentially trial-and-error or trial-and-success learning. A person who is required to react to all objects of one class in one way, as, for example, a berry picker who is required to pick only those berries ready to be packed and sold is likely to make errors when he first begins to pick. His failures will stimulate him to analyze what he is doing, and out of this analysis he may discover some clue, some characteristic peculiar only to berries ready for picking, that will help him in his continuation of his task. Woodworth describes the learning process as isolation by trial and error. He says:

> An individual who has to respond to all the objects of one class in one way – as by giving each one the class name, or by handling it properly – and to other objects differently, makes errors *at first, but being checked up* by his failures is stimulated to analysis. After a failure, he may wonder what was wrong, look more sharply and seek some clue that will guide his future responses. Or, if he has been failing repeatedly, and suddenly meets with success, he wonders how this can be, and looks sharply for the cause of his unexpected success.[4]

The discovery of the cause of a success, combining as it does both the effects of satisfaction of being right plus insight into the rightness of a situation, becomes potent in fixing or strengthening the essential feature which is the causal element of success. The more clearly the essential feature that needs to be isolated stands out, the simpler is the task of isolation, and the easier, therefore, will be the learning process in the formation of concepts.

Speech and Thought

Thinking and Conversation. In ordinary conversation (as we have already noted – see p. 11) the stimuli (words or speech forms) used by a speaker call forth responses from the person addressed, whose responses in turn cause reactions to occur in the first speaker. This much is obvious and readily observed. What is not observed is that in conversation not only do the first speaker's words elicit responses from the hearer but also from the speaker himself. There are then two responses to the words or speech forms used as stimuli in conversation: the responses of the speaker (to his own stimuli) and the responses of the person addressed (to the stimuli).

[4] *Op cit.*, p. 460. (Italics supplied.)

In thinking, the stimuli we use cause responses to take place only in ourselves. The responses are implicit and do not immediately result in direct action. For example, when a person thinks, "Shall I go to the theater?" he does not immediately proceed to the theater, which would constitute the direct activity. Instead, he reacts implicitly and indirectly to the idea. If the weather is unpleasant, or if the person recalls that he has already seen the performance, or if he suddenly realizes that he is without funds, he will probably decide against going. If weather, performance, and funds favor him, he may *then* go to the theater. The implicitness and indirectness of response are outstanding characteristics of thought.

It might help to clarify our discussion by representing the thought process schematically: "S (the original stimulus or trial idea) $\xrightarrow{\text{calls forth}}$ R (implicit response) which in turn becomes S (the new stimulus or trial idea) $\xrightarrow{\text{calls forth}}$ R (the next implicit response), etc." With modifying and parenthetic phrases removed the schematic formula becomes reduced to S→implicit R (S)→R. The formula representing the thought process is fundamentally the same as one we might use to represent an ordinary conversation. The difference lies in the fact that in conversation the stimulus or word used by the first speaker calls forth an overt reaction (speech) from the person spoken to; his response in turn elicits an overt response (further speech) from the first person. We should note, too, that in ordinary conversation not only does the first speaker's stimulus call forth a response from the person addressed, but that a response is elicited from the first speaker as well. In discourse, the words we use cause reactions in ourselves and in our

listeners. In thinking, however, the words we use call forth responses *only from ourselves.*

There is another important similarity between conversation and thinking. Frequently the individual engaged in thought plays a dual role: he is at once himself and another pretended person whom he is stimulating by speech. He responds to the stimulation in the light of how he believes another real person in an actual social situation would respond. The user is employing speech symbols in a not-as-yet-present social situation; he is anticipating the effects upon others of the significant speech symbols he is using, and is controlling his behavior in the light of these effects. Thinking, as differentiated from overt discourse, is an internalized conversation of the self with a "generalized" other person.

Progression from Explicit to Implicit Speech in Thinking. In our earlier discussion of the development of speech in the infant and child we saw that the young person learns the meaning and use of words when their utterance results in the satisfaction of his wants. The small child for a long time does all his talking out loud. Usually the words uttered are accompanied by actions appropriate to the words. The young, uninhibited human animal talks almost incessantly while playing. For him, society has not yet brought to bear that pressure which eventually will cause him to internalize his speech. Adults, however, are perforce sensitive to the pressures of civilized society and do not usually permit themselves the luxury of talking out loud when they are talking to themselves. Thus, a child searching for a toy and going from room to room in his house may be heard to say, "No, not here; I go look in the next room; not here, I look some more. I found it." An adult, however, may do the same sort of talking, except that no one will hear him.

If he is searching for a misplaced fountain pen he may internally say, "Not in this pocket, perhaps it's in the pocket of my other suit," or, "Not in my desk drawer. I wonder if it's on the bookcase. Yes, here it is." Perhaps, if the adult is all alone in his home he may do as the child does, and talk out loud, with appropriate and even vehement gestures accompanying his spoken words. All of us know that we do this very thing. Usually the speech of thought is implicit and unheard. But if for some reason social inhibitory pressures do not function (as under emotion), or in situations where society accepts talking out loud to oneself as not too unusual (as when solving rather difficult problems) the talking process may become overt and vocalized. Bode says:

> . . . The average adult is talking all the time during his waking hours and even in his dreams. Most of this talking is not audible, but takes the form of "implicit response" or "sub-vocal speech." It consists of muscular contractions in the lips, tongue, throat, and chest. Much of this verbalization may go on without any awareness on the part of the person concerned. Because of this tendency to verbalize, the things that we do get themselves expressed simultaneously in vocal and sub-vocal speech. A person reaching for a newspaper or disposing of an umbrella will say "pick up newspaper" or "put umbrella in corner" as the act is performed. Consequently the act which gets itself recorded in the nervous system is in part a verbal response. . . .[5]

In the normal development of thinking, which may be exemplified in the child, there is a gradual transition from overt to whispered and then to implicit speech. There is no way of determining definitely the times at which these transitional stages take place. Nor do the stages apply to all types of situations in which thought is used. Thinking may

[5] B. H. Bode, *Conflicting Psychologies of Learning* (D. C. Heath and Co., 1929), p. 143.

be entirely implicit for both children and adults in adding a single short column of numbers, but may become overt and explicit during the solution of a difficult arithmetic problem. Furthermore, individuals may think implicitly in problem situations when they are in the company of others, but may think explicitly when alone and social pressures are not present, even though they are confronted by essentially the same problem. Social pressure is one of the most potent determinants as to whether thinking is to be internalized or vocalized. Insane people, who are not inhibited by social pressures, think out loud much more often than normal people.

Thinking as Abridged Talking. Normal people take some pains in their ordinary discourse to speak clearly and distinctly, uttering words in their entirety. Under special conditions (as in industry and in sports), shortened oral or written terms and abbreviations may be used to save time. The short cuts and abbreviations, however, must be understandable to others. In thinking, the abbreviatory process is extended. Each person's implicit speech consists of many individual abbreviations and short cuts which would make it, if vocalized, incomprehensible to others. What frequently remains of an entire word or sentence may be only a mere fragment of the word. The speech mechanism shares in this economy; it needs merely to initiate an activity for the human organism to recall and react to it as once it did to the activity performed in its entirety. For example, when first we add a column of figures such as 7, 4, 8, 3, we may say "Seven and four are eleven and eight are nineteen and three are twenty-two." Later we reduce it to "Seven – eleven – nineteen – twenty-two." Finally we may find it sufficient to say to ourselves, "Se – 'leven – 'teen – twenty-two." Ultimately we are able to add the column of figures

so rapidly that we become unaware of any speech activity, overt or implicit. But it is present nevertheless, even though it is only fragmentary. And the speech need not be vocal, for a bodily act or a gesture, as in the case of deaf-mutes, may also be used in thought.

Experimental Evidence to Establish Identity of Thought and Speech. Perhaps the criticism may be made that subvocal speech is a habit carried over from an earlier developmental period, and that such people as congenital deaf-mutes who have never spoken vocally think without the use of the speech mechanism. Fortunately, Max [6] performed a series of interesting and very pertinent experiments along these lines. In one experiment, he attached extremely sensitive leads to the arms and fingers of deaf-mutes. The experimental subjects were then presented with a series of problem situations to solve, varying in type and degree of difficulty. Action current photographs were taken of the responses registered on the electrical apparatus as a result of the arm and finger movements. The results showed definitely that finger responses were registered during the thinking process. Max concluded from this experiment that the hands and arms of the deaf-mutes were the seat of both their spoken and written speech.

Another experiment in which both normal speaking persons and deaf-mutes took part was performed by Max [7] with sleeping subjects. Once again sensitive electrical leads were attached to the arms of the persons in the experiment. The results of this experiment showed that, even during sleep, action currents continued, though on a minimum basis, and were reflected by responses from the pe-

[6] L. W. Max, "An Experimental Study of the Motor Theory of Consciousness – II," *Journal of General Psychology,* XIII (1935), 159–175.

[7] L. W. Max, "An Experimental Study of the Motor Theory of Consciousness," *Journal of Comparative Psychology,* XIX (1935), 469–486.

ripheral musculature (arms and hands). Further, it was shown, that the onset of *dreams* in deaf subjects could be detected generally by the appearance of large action current responses in the arm and fingers. Such currents were in most instances unaccompanied by overt muscular movements and were usually distinguishable from those due to changes in the position of the body.

There should be little doubt, then, that in the developing human organism, speech and thought are essentially one and the same process. In both situations, the speaker has some specific result to achieve. In both the basic psychological process is the release of stimuli which call forth reactions to accomplish the desired result. Now let us examine the materials and tools used in speaking and thinking.

Thinking, Remembering, and Speech. As we have pointed out, the activities of the child and the activities of the adult are accompanied by speech. In the child it is audible and vocalized speech; in the adult it is usually subvocal speech. Consequently, acts which are recorded in the nervous system include verbal responses. These verbal responses are the fundamental elements of our memories. Bode states:

> When these verbal responses have thus become a part of the total response, we can talk about what we have done by rehearsing the various steps. All we need to do is to reinstate the verbal process; this constitutes remembering. Consequently this form of remembering goes back only to events which were accompanied by verbalization. We cannot remember things that happened before we learned to speak. For some unexplained reason it is easier to repeat an act if we have verbalized it than it is to repeat independently of verbalization. It would be a tremendous job to learn to write the successive letters of the alphabet

> in correct order without the help of names. It is much easier, apparently, to associate the verbal *a* with a verbal *b* than to associate manual *a* with manual *b* through the verbal series. The longest way around is the shortest way home.[8]

What Bode says we know to be true from our own introspection. Adults can remember many things that happened in their early childhood, but nothing of what happened in their infancy before they learned to speak. We know also that if we wish to remember how to return to a place we have visited, we tend to say to ourselves as we go there, "I walk one block down the street, then turn two blocks to the right, and it's the second house on the left side of the street." Unless we have verbalized our steps, we are likely to forget our directions. Fortunately, the process of verbalization goes on almost unconsciously, even when we are given directions by another person.

Sometimes we do not bother to verbalize specific statements, but instead verbalize principles or generalizations derived from them. This is especially true in problem-solving. If, in solving one problem, we formulate in words the principles of our solution, we can rather readily recall these principles and apply them when next we meet a similar problem.

Association of Ideas in Thinking

Reasoning. Rational thinking is determined by the purpose, attitude, interests, or wants by which the individual is influenced at the time of thought. The associational processes in the stream of thought are controlled and directed toward the solution of the problem which initiated the thinking process. Now, such planful thinking is rather

[8] *Op. cit.*, pp. 145–146.

difficult and laborious and usually takes place only when the individual's habits and already established response patterns are not adequate for meeting a new situation. This directed thinking which we may call reasoning involves the selection and utilization of appropriate ideas or signs and the inhibition or repression of inappropriate ideas or signs. It is a trial-and-success-process: What helps us is retained, what does not further the solution of the problem is discarded.

Reasoning differs from ordinary trial-and-success activity in that motor exploration is replaced by mental exploration. If one is looking for his lost fountain pen and searches through his memory asking himself, "Where can the pen be? It should be where I last used it." And if the person recalls where he last used the pen and goes there, he has employed reasoning, having replaced the actual motor exploratory process with mental exploration.

Free Association and Autistic Thinking. Most thinking, and we are always thinking when conscious, is not of this high order. Our thoughts, our private and internalized conversations, like our ordinary discourse with friends, may begin anywhere and end anywhere. Normal people, however, are capable of checking their stream of thoughts, just as in normal conversation there is a check, to some degree, on the course of the conversation. Abnormally agitated persons have no such checks and controls on either their conversation or thoughts. Moreover, the flights of ideas of such persons are even more extreme than those of the normal. In those moments, however, when we are unchecked and uninhibited in the stream of thought as in reverie, the differences between normal and abnormal thinking break down. We will objectify this point by comparing a typical reverie with a manic's flight of ideas. We will present first

an example of the internalized speech of a normal person and then a specimen of overt manic speech.

> In the prime of life, thought Gant. Myself like that some day. No, for others. Mother almost eighty-six. Eats like a horse, Augusta wrote. Must send her twenty dollars. Now in the cold clay frozen. Keep till spring. Rain, rot, ruin. Who has got the job? Brock or Saul Gudger? Bread out of my mouth. Do me to death – the stranger. Georgia marble, sandstone, base, forty dollars. . . . Four cents a letter. Little enough, God knows, for the work you do. My letters the best. Could have been a writer. Like to draw too. And all of mine! I would have heard if anything – he would have told me. I'll never go that way. All right above the waist. If anything happens it will be down below. Eaten away. Whiskey holes through all your guts. Pictures in Cardiac's office of man with cancer. But several doctors have to agree on it. Criminal offense if they don't. . . .[9]

This type of casual, uninhibited internal speech, where one idea touches off and suggests another, is not inherently different from the speech of the manic:

> Now I want to be a nice accommodating patient; anything from sewing in a button, mending a net, or scrubbing the floor, or making a bed. I am a jack-of-all-trades and master of none! . . . Oh, I am quite a talker; I work for a New York talking-machine company. You are a physician, but I don't think you are much of a lawyer, are you? I want him to take evidence. . . . I will make somebody sweat! I worked by the sweat of my brow! (Notices money on the table.) A quarter, twenty-five cents. In God we trust. United States of America; Army and Navy forever![10]

There is one important factor we must not overlook in comparing normal reverie with abnormal flight of ideas.

[9] T. Wolfe, *Look Homeward, Angel* (Modern Library edition), p. 72.

[10] A. J. Rosanoff, *Manual of Psychiatry*, John Wiley and Sons, sixth edition 1927, p. 47.

The normal person can usually retrace the steps of the reverie and he can, if the need arises, check his thinking at any point in his stream of thought. Abnormal persons can neither retrace their flights of ideas nor check their thinking. The abnormal person thinks and talks the way he does because he cannot help himself, because social inhibitions do not control his conduct. The normal person indulges in reverie because at the given moment, at least, he does not wish to inhibit himself. The presence of another person, or any sudden change in the social situation, is usually sufficient to put a stop to reverie and to cause a more ordered type of thinking or internalized speech.

PART III

THE DEVELOPMENT OF SPEECH AND LANGUAGE IN THE CHILD

CHAPTER EIGHT

THE EVOLUTION OF SPEECH IN THE INFANT AND CHILD

The child who is born into the world with a normal mechanism, with organs capable of being adapted to articulatory movements and vocalization, must still *learn how to produce* oral speech. Learning to speak is basically an educational activity; as such, it requires motivation, reward, and a pacing of the material to be learned in keeping with the physical and mental development of the learner. Fortunately for most parents, the speech-learning process for children generally proceeds with neither parent nor child being quite aware of how or when the learning begins to take place. In fact, the infant is generally capable of producing a fairly large number of bodily and oral gestures before the parent even begins to expect that the time has arrived for the infant to begin to speak. Of course, the infant is not aware of the importance of the expressive gestures he is producing; he does not know that his unwittingly produced gesture movements are part of a system of speech he will later develop.

The biological notion that ontogeny recapitulates phylogeny is in a large sense true in the psychogenesis of the spoken word in the infant and child. Beginning with crude, reflexive, emotionally motivated responses and culminating in fine, differentiated, subtle responses, the speech of the infant repeats the development of the speech of primitive man. Like primitive man, too, the infant learns to speak because he feels a need to use the spoken word; he, too, happens upon vocalized speech as an accident which,

fortunately, takes place when he has brains enough to take advantage of the significance of the accident. As with primitive man, the oral word is developed and largely substituted for the gesture word because the infant and child frequently has his body and especially his hands so occupied that expressive movements are difficult and inconvenient to produce. Finally, the infant and the child learn that by using the oral word, they can cause reactions in persons not in their immediate presence. The oral word is substituted for the gesture word because it affords the infant more pleasure, more reward. It satisfies the needs and wants of the developing child more frequently and more adequately than does the gesture, and hence, for the most part, supplants it.

Stages in the Development of Speech

1. *The Undifferentiated Cry.* The first reactions of the newborn infant to his environment are reflexive, total bodily responses. The infant reacts as a whole to the stimuli that come to him out of a world full of whirling, buzzing confusion. Crying, the infant's first vocal activity, is part of a purely reflexive total bodily response to chemical-nervous stimuli within his organism. The carbon dioxide in the blood stream acts upon the medulla, causing nervous and muscular innervations which finally result in an expulsion of the breath from the lungs. This expiration of breath sets the vocal cords into vibration and gives rise to the birth cry. The cries which follow and which may be caused by sensations of pain, hunger, thirst, heat, cold, or other sources of discomfort, are also reflexive, total bodily responses which lack specificity and direction. The nature of the irritant does not significantly alter the character of the response. This lack of differentiation persists in a very

large measure at least through the first month of the infant's life, and sometimes through part of the second month. Blanton [1] studied infant crying under conditions in the infant which included the following states: hunger, responses to noxious stimuli such as rough handling, circumcision, lancing and care of boils, sores, etc., and fatigue. She observed that the cries in response to any one of these states were not uniform for all infants. Differences were noticed to exist in regard to vowels and consonants produced, timbre, and degree of intensity. The cries, however, were used interchangeably by the same child. For example, the cry as a response to noxious stimuli was fundamentally the same as the cry in response to hunger, with an exaggeration in degree of intensity. A possible exception is the colic cry. Blanton described it as starting abruptly on a tone three to five octaves above the adult female voice, and sliding through a "modified chromatic scale to within range of the middle octave." The differences in the colic cry can be accounted for by its muscular innervation. The muscles of the abdominal walls are rigid and tense. The extraordinarily high degree of muscular tension is probably shared by the body as a whole, including the muscle folds known as the vocal cords. This would explain the unusually high pitch of the cry.

In general, we might conclude that even the fondest and most sensitive of mothers is unable to determine by listening to her child's crying just what he needs or wants during the first month of his life. The mother has to *see* her child as well as hear him before she can decide whether to feed him or bring him a change of linen.

Despite the lack of differentiation in the early crying of

[1] M. G. Blanton, "The Behavior of the Human Infant during the First Thirty Days of Life," *Psychological Review*, XXIV (1917), 456–483.

the infant, there is one important similarity between such crying and later talking. The breathing of the infant in crying and the child in speaking are alike in that both are characterized by short, quick inhalation, and slow gradual expiration. The reflexive cries of the month-old infant, though they contain the germ of articulate speech in the form of the presence of different vowels and consonants, cannot, however, be considered as true speech. The sounds are produced unconsciously and accidentally, with no intention on the part of the producer to use them to fulfill any one of the functions of speech, or with any realization that such functions are being served.

2. *Differentiated Crying.* Differentiation in the sounds of crying may become discernible after the first month of the infant's life. The crying continues to be a total bodily response to a situation. The type of bodily response, however, varies with the situation, with the nature of the stimulus or combination of stimuli. For example, the sensation of hunger – caused, among other things, by a contraction of the muscles of the stomach – results in changes of *all the muscles of the body,* including those involved in the production of the speech sounds. These changes, when accompanied by vocalization, give rise to the type of cry which we come to recognize as a hunger cry characterized and distinguished from others by its rhythms. So, also, skin irritations, thirst, pressure, etc., give rise, because of special types of total bodily responses, to characteristic cries which accompany the responses. At the beginning, these responses are more or less fixed, and may be considered as pattern-responses, that is, complexes of movements which occur from time to time, and which are called forth by certain types of stimulus situations. The pattern-response as a whole is usually directly adaptive in that it adjusts the relations

of the organism (the infant) and his environment so as to result in the satisfaction of a need or a want. The intake of food, or the avoidance of painful pressure are examples of such satisfactions. The sounds which are uttered are merely elements in the pattern-response. "These sounds which arise from the respiratory, throat and mouth innervations, are characteristic of the total pattern-response, and hence of the stimulating conditions capable of eliciting these responses." [2] Because of the characteristic qualities of the sounds, the mother of an infant learns to recognize her infant's cries and reacts to the cries as signals which announce his needs.

3. Babbling. Babbling follows the stage of differentiation in crying. Babbling usually begins toward the end of the second month. It may be considered a type of vocal play consisting of a great variety of sounds uttered at random. The variety of sounds produced in babbling is probably greater than any of our records can indicate. Recorders are able to indicate only those sounds which are recognizable to them, those sounds for which they have some written symbol. But adult speech sounds are highly selected, and vary from language to language. The babbling infant makes no such selection. He produces many more sounds than are present in any individual language. The babbling period is the first stage in the progression toward a true use of spoken words.

Though the order of appearance of the sounds produced by infants has not been definitely determined, it is usually agreed that the first sounds adults hear in an infant's babbling are vowels. In fact, the first sound of the infant cry is a vowel, probably a variety of [a] repeated at length. The

[2] E. Esper, "Language," in *Handbook of Social Psychology* (ed. C. A. Murchison, Clark University Press, 1935), pp. 417–457.

consonantal sounds begin with the labials, and are followed in order by gutturals, dentals, and finally nasals. The reason for this order of emergence is not certainly known. One theory holds that the type of food the infant eats is the causal factor. The suckling or milk-fed child needs only his lips and pharynx for eating (his tongue lies at the floor of the mouth), so we get labials and gutturals. When the child is fed semi-solid food, the gums come into play. Some of the food may stick to the gums, with alveolar or dental sounds resulting. It is very possible, however, that the infant becomes gum-conscious when his teeth begin to erupt. He may touch his gums with his tongue to ease their soreness, and so produce a dental sound. Because the type of food eaten by the child and his physical development are interdependent, we cannot determine which factor is the cause of the other. The mental development of the child we know is closely correlated with physical maturation. To determine the accuracy of the theory we should have to feed a control group of infants on a liquid or semi-liquid diet for a considerably longer period than normally. If the omission of solid foods should result in an absence of dental sounds, there would be some substantiation for the theory. The infant would have to co-operate with the experimenter by refraining from erupting teeth during the period of experimentation! The eruption of teeth would so complicate matters that results would be inconclusive. Sully offers an explanation of the order of sounds as the result of changes in the nervous system. "As the centers of vocalization develop, motor impulses begin to play on the muscles of the throat, larynx, and later on lips, tongue, etc.; and in this way a larger and larger variety of sounds and sound combinations are produced." [3]

[3] J. Sully, *Studies of Childhood* (Longmans, Green and Co., 1895), p. 137.

In babbling, as in crying, sound is an accompaniment, by-product or element of a total pattern-response. The entire babbling period may be considered as a rehearsal for articulate utterance. The infant receives practice in the production of articulate sounds, many of which he will discard and some of which he will later use in subsequent stages in the evolution of oral speech. The babbling stage usually continues until about the end of the fifth month in the infant's life.

The speech development of the congenitally deaf child ends with the babbling stage. He does not continue babbling for as long a time as does the hearing child. The speech of the deaf child does not progress to the lallic and echolalic stages because he cannot hear the sounds he makes, and so cannot reproduce heard sounds. Whatever self-imitation in sound production does occur is probably determined by the ease of kinesthetic production and the pleasure derived from the production of the sound. The self-reward of pleasurable oral sensation importantly present in the hearing child, is lacking in the deaf child.

4. Lallation. Lallation [4] may be defined as the repetition of *heard* sound complexes *or syllables.* This stage begins usually during the second six months of the infant's life. According to Stern,[5] however, imitation of sounds which have been produced in babbling does not occur before the ninth or tenth month. At first, the only sounds produced are those the child has himself produced in his babbling. The infant reproduces those sounds which are pleasurable to his ear. The first step in lallation, very likely, is the production of a sound complex or syllable which occurred

[4] This should not be confused with the term denoting a disorder of speech characterized by defective articulation or sound substitution.

[5] C. and W. Stern, *Die Kindersprache* (Leipzig, 1907).

originally because of a motor reflex process involving the vocal mechanism. In this respect it is no different from babbling. The important difference is that in lallation the child hears the sound he has produced, derives satisfaction from it, and imitates it. The successful imitation is an added source of pleasure, and serves as an incentive for further repetition. Thus auditory and kinesthetic impressions become associated with feelings of pleasure and satisfaction, and the infant learns that he can imitate sounds that he has himself produced. After he has learned to imitate many sound combinations of his own accidental, motor-reflexive making, he has laid the foundation for his next step in the development of speech, echolalia.

5. *Echolalia.* Echolalia is the imitation by the infant of sounds he hears others make, but which he does not comprehend. It is like lallation in that the child produces those sounds which are pleasurable to his ear. It is unlike lallation in that another individual provides the stimulus for the child which becomes the impetus for the repetition of a sound. The lallation and echolalic periods are of tremendous importance because during these stages the child acquires a repertoire of sound complexes which ultimately he will come to be able to produce at will, and which he must have before he can learn to speak, or acquire a language, in the adult sense. The echolalic stage of speech begins at about the ninth or tenth month of infancy and lasts throughout life.

6. *Verbal Utterance.* Before the child can acquire a language he must have verbal understanding. By verbal understanding we mean responding with certain appropriate bodily movements to words or phrases pronounced by others. According to Esper,[6] the "establishment of conven-

[6] *Op. cit.*

tionalized speech sounds as adequate stimuli for releasing bodily movements or postures" begins during the last months of the first year. *Verbal utterance,* which is "the establishment of conventionalized speech reactions as specific responses to socially presented stimulus patterns" usually begins during the first half of the second year. The acquisition of a language is based upon the same principles of learning that cause the child to repeat a sound he himself has made, in the lalling stage, or to echo a sound someone else has made, in the echolalic stage. A pleasurable sensation follows closely upon the utterance of the given sound word. The first sound word was uttered, in all likelihood, as an accident, without the child realizing or knowing that the sound had any special meaning or intellectual content. For example, the child may and probably does produce the sound complex which we recognize as *mama,* many, many times purely as an emotional or motor-reflex response. But *mama* does not become a word until that wonderful time when the mother hears the child utter that sound, and elated, goes immediately to him. Then the mother repeats the sound, not without satisfaction to herself, and the child imitates the mother's sound (echolalia) with more pleasure. Thus, the sound complex *mama,* becomes associated with satisfaction; and finally, *mama* is uttered to bring about the source of satisfaction. We should note, however, that the first imitation was that of the child's sound by the mother, and that the original sound was most likely produced accidentally, or at least involuntarily, by the infant, as a part of a total pattern response, with vocal expression accompanying motor expression. The mother's imitation was, of course, confined only to the vocal expression or sound complex. This sound complex was in turn imitated by the child. In the process of reciprocal imitation

the overt motor activities which gave rise to the given sound complex disappeared, so that finally, all that remained was the vocalized word *mama.* Hereafter, whenever the child says *mama* at the sight of his mother, or says *mama* in order to get his mother to come to him, he may be said to be truly speaking because he has *established conventionalized speech reactions* as *specific responses to socially presented stimulus* patterns and has learned to use these specific responses as stimuli for responses on the part of other persons.

After the child's first few voluntary words there generally is an interval before further progress can be noted. During this interval which may be as long as two months, there is usually a great increase in the comprehension of speech. In the matter of "words" the small child's comprehending vocabulary is many times that of his using or speaking vocabulary. Though the ratio of the differences decreases with the age of the child, the comprehending vocabulary always remains larger than the speaking vocabulary.

We have now reached the stage in the development of infant speech in which the child is learning a language. Before continuing with an analysis of the acquisition of language, we will pause to review the steps in the development thus far.

1. The first *vocal response* is the birth cry, which is an accompaniment of a motor-reflexive, total bodily response to a new environment. This is an undifferentiated cry, and cannot be discerned from the cries which are reactions to pain, or hunger, or thirst. *Differentiated crying,* that is, crying that can be *recognized as indicative of the presence of a specific need or want,* does not occur for two or three weeks. Differentiated crying is also a vocal accompaniment of a total body response to a more specific type of situation.

2. *Babbling* is heard about the end of the second month. Babbling is a type of vocal play in which a great variety of sounds, more than are present in any one individual language, may be heard. Vowels appear first in babbling, followed in order by labials, gutturals, dentals, and nasals.

3. *Lallation,* or sound imitation, usually begins in the sixth month. The child imitates his own sounds.

4. *Echolalia,* the imitation of sounds made by others, but not understood by the child, is the next step. This begins about the ninth month and lasts, in a modified form, throughout the life of the individual.

5. *Verbal utterance* brings the child to the stage where he is engaged in acquiring language. In this stage the child is establishing a repertoire of conventionalized speech reactions as specific responses to socially presented stimulus patterns. This stage usually starts at about the beginning of the second year of the child's life. It may, however, begin a month or two earlier, and sometimes not until the third year.

It must not be thought that the several stages are discrete, one beginning where the other abruptly ends. There is considerable overlapping in all of the stages. A child may still babble after he has acquired a considerable vocabulary of real words.

CHAPTER NINE

LANGUAGE DEVELOPMENT IN THE CHILD

The First Word. The first words spoken by the child are generally monosyllables, or duplicated disyllables such as *papa, mama,* etc. This marked inclination in the direction of duplication may be an indication of the persistence of the echolalic tendency, and as such a carry-over from an earlier stage of speech development. Other theories have been proposed to explain sound reduplication. Sully [1] suggests that the first reduplications may be caused by physiological inertia, the tendency of the musculature to continue in the direction which has been established. It may be of interest to note that the language of primitive men as still represented by the Africans and South Sea Islanders is marked by many sound reduplications. The possibility that there is a common cause for the existence of sound imitation among both primitive men and infants suggests itself. We are, however, in no position to hazard a guess at what might be the common cause.

The first words have a high emotional content. This should not unduly surprise us when we realize that the child understands and reacts to the emotional elements of words – the melody and pitch – before he understands their intellectual content. Another factor to be considered is that the first words directed at the child by adults are likely to be emotionally colored: words of warning, expressions of affection, exhortations, admonitions, etc. Though the child does not understand the full meaning of the word, he does understand its emotional implications. Because of this the

[1] J. Sully, *Studies of Childhood.*

connotative meanings of a word are at first better and more completely understood than the cognitive and limited meaning. A word to the child is not the definition of an object, a person, or an activity but rather a recollection of an experience. Words recall not objects but experiences associated with objects. When a child speaks a word he intends by it to announce his emotional attitude toward the word, his desires, wishes, or needs in regard to the word and the experiences for which it stands.

A single word utterance, such as *mama* is in reality a sentence, in that it is used to express a complete thought, to communicate the child's reactions about *mama* at the time the word is uttered. Vocal expression and inflection assist in making a sentence of a single word. Thus, any one word may be used to express a multitude of meanings. For example, *mama* may mean: "I want my mama," or "Mama give me the doll," or "Mama, I love you," or "Mama, pick me up," or even "Mama, you're something of a bother, I wish you'd go away and leave me alone." When we realize that the child's mother has become associated in his mind with each of these particular types of emotionally colored situations, and that these associations have become strengthened and fixated through repetition, we no longer have cause to wonder why the child expects his mother to do just what he wishes when he merely utters a single word.

Mothers usually have a way of knowing what the child wishes at the given moment by reading into the utterance of the word the specific situation that surrounds it. If a mother and her child are playing with a doll, the mother is very likely to hand the doll to the child when the child says *mama* properly inflected and modulated. If the mother has just left the child after playing with him, and the playing has been of such a nature that the child as well as the

mother have derived pleasure therefrom, the ability of the spoken word *mama* to recall mother to continue the fun is easily understood. Should the mother return because of the child's utterance, another meaning of the word *mama* comes into existence. Thus, the many possible meanings of any one word may be multiplied according to the number of situations in which the object and the name for the object are likely to appear. The appearance of the object and its associated name must create a state of satisfaction for the child if the connection is to become permanent.

The first words are most likely to be nouns with wish-fulfilling import. The several sentence meanings expressed by the word *mama* are all of this nature. The child is not particularly interested in having the members of his environment known that he has mastered a name for an act or object; his utterance is intended rather to indicate his desire or attitude in regard to the particular act or object.

The Sentence. Not only does the child use isolated words as sentences, but his understanding of a sentence, in the adult sense, is dependent upon the position of the particular known word in the sentence. Thus, if the recognized word stands out because of its initial position, or because it is stressed when the entire sentence is enunciated, the child will react to the word and appear to understand the entire sentence. The writer's daughter, when eleven months of age, was taught to point to her ear, eye, nose, or mouth on command. At first only the word associated with the desired action was uttered, so that when the child heard *ear,* she placed her hand on her ear – if she was so minded at the given moment. Later the particular command word was included in a phrase or sentence, but always in such a position or so stressed that it stood out boldly. "Baby puts her hand

on her *ear*" was understood and obeyed, but the child completely ignored a poorly trained but well-meaning relative who said, "I'll bet the baby can't put her hand on her ear when I ask her." Even if she could have, she didn't. The word *ear* was so obscured in the aunt's lengthy and defiant request that the child was unable to pick it out and react to it. The sentence, then, makes word understanding more difficult by obscuring and preventing the recognition of words which might very well be understood when isolated. Because of this, the sentence has a word value to the beginner, and isolated words have sentence value.

The single-word stage may be observed as early as four months, but generally does not begin before nine months. At about thirteen months, disconnected words are combined and used in sentences. The noun-verb combination usually appears first. "Baby eat" or "Baby walk" are typical noun-verb combinations which may be heard between thirteen and twenty-seven months. Preyer [2] holds that there is increasing comprehension of longer sentences before the child uses many disconnected words. At first, as we have suggested, only parts of the sentences are understood. From the point of view of conventional grammar the words are not really combined into sentences at all. The child pays little attention to the conventions of grammar until he is almost four years of age. At this time he begins to master six- to eight-word sentences.

A study of sentences by beginning speakers was made by Bloch,[3] who used his own children as subjects. Bloch's three children began to use two-word sentences between nineteen

[2] T. W. Preyer, *Die Seele des Kindes* (Leipzig, 1912).

[3] O. Bloch, "La Phrase dans le langage de l'enfant," *Journal de psychologie normal et pathologique,* 21st year (Jan. 15–Mar. 15, 1924), pp. 18–43.

and twenty-three months. At the end of the twenty-third month one of his daughters combined seven words into a group: carriage – friend – Helen – hat – drive – rain – umbrella.

The author's daughter began to combine words at fifteen months. "Mama go 'way" was her first conventional sentence. The sentence was used to express several ideas, each one differentiated from the others by inflection. "Mama go 'way" sometimes merely expressed the notion to any adult person present that the child knew her mother was not among those in sight. When uttered plaintively, the words expressed a desire for her mother to return. Occasionally the sentence was pronounced with an upward inflection on the last sound, and meant "Did mother go away?" or "Will mother come soon?" At sixteen months the child spoke the sentence "Doggy says bowwow." The longest combination of words uttered by the child before the end of the sixteenth month was "Doggy says bowwow, heigh dog." The child raised her arm in a gesture of greeting when she uttered the last two words.

Parts of Speech in the Vocabularies of Children. The first word to appear in a child's vocabulary as we have indicated, is generally a noun, the name of a person or thing. Verbs may follow shortly after the nouns; adjectives, adverbs, and pronouns are late in appearing. Articles, prepositions, conjunctions, make their appearance last, and are often omitted even after they have been learned. Interjections form a large portion of the vocabulary of the younger child. It must be remembered, however, that any and all of these words can be shifted, from a functional point of view, from one word category to another. We have already mentioned that the word *mama,* when uttered alone, has sentence value, and may mean among other

things, "I want my mother," or, "Mother, give me food." The word *mama* is, however, for the sake of ease and convenience, classified as a noun. If we were strictly accurate we should enter the word under several different categories. Stern [4] and other students of children's speech believe that the word categories emerge according to the need of expression or "speech-need" and comprehension of the developing child. Nouns and verbs precede the other word-categories because they most easily express the child's desires, and are the words that are first comprehended. This may possibly be so because nouns and verbs are frequently stressed in the spoken sentence. Verbs are for a long time used by the child only in the infinitive form, though different tenses are intended.

The proportion of nouns to other words decreases as the entire vocabulary increases. McCarthy [5] found that in the early sentence stage (thirteen to twenty-seven months) 65% of the words used are nouns. Between three and four years of age, the percentage decreases to 20%. The proportionate number of nouns continues to remain large in adult vocabularies.

The sentences of children under two years of age are characterized by an economic peculiarity: articles, prepositions, conjunctions, etc., are not used. For example, a sixteen-month girl said "Mama hat" on seeing her mother put her hat on before leaving the house. As a rule the child is satisfied to put the verb next to the noun, omitting entirely any word expressing relationship. Occasionally the child below two years of age seems to be using articles or prepositions in some sentences. The likelihood is, however,

[4] C. and W. Stern, *Die Kindersprache.*

[5] D. McCarthy, *Language Development in the Pre-School Child* (University of Minnesota Press, 1930).

MEAN PER CENT OF EACH PART OF SPEECH BY AGE AND SEX
(Based on Total Number of Words Used)
[From McCarthy]

Age in Months	*Sex*	*Nouns*	*Verbs*	*Adjec.*	*Adv.*	*Pronouns*	*Conjunct.*	*Prep.*	*Interj.*	*Misc.*
18	B	43.6	16.7	5.1	5.1	12.8	.0	.0	16.7	.0
	G	51.5	13.1	10.7	8.5	9.8	.6	.0	5.5	.3
	All	50.0	13.9	9.6	7.9	10.3	.5	.0	7.6	.3
24	B	49.3	15.3	5.8	3.7	15.0	.0	2.0	3.4	5.4
	G	35.5	22.6	11.6	8.0	14.5	.7	4.1	2.2	.8
	All	38.6	21.0	10.3	7.1	14.6	.5	3.6	2.4	1.8
30	B	25.4	24.9	14.4	6.3	21.0	.5	4.3	1.5	1.8
	G	26.0	22.3	14.3	6.9	17.6	2.5	4.9	3.8	1.7
	All	25.8	23.4	14.3	6.7	19.0	1.7	4.6	2.8	1.8
36	B	23.6	23.5	15.4	7.8	21.3	1.1	5.4	1.5	.6
	G	23.2	22.5	16.7	6.3	17.3	3.7	8.4	1.5	.5
	All	23.4	23.0	16.1	7.0	19.2	2.4	6.9	1.5	.5
42	B	18.5	25.3	15.1	8.4	19.7	3.0	6.7	2.4	1.0
	G	18.5	27.0	16.6	7.0	21.8	1.3	5.8	1.6	.5
	All	18.5	26.0	15.7	7.8	20.3	2.3	6.3	2.0	.8
48	B	19.7	26.8	13.7	6.7	20.5	3.3	7.3	.9	1.0
	G	20.4	25.3	15.4	5.2	22.5	3.8	6.2	.6	.6
	All	20.1	26.0	14.6	5.9	21.6	3.6	6.7	.8	.8
54	B	19.4	25.0	14.4	7.7	21.1	4.0	6.7	.9	.9
	G	19.3	25.3	16.1	6.3	19.9	3.5	7.6	1.4	.6
	All	19.3	25.1	15.2	7.0	20.5	3.8	7.1	1.2	.8

that in such instances the article or preposition is used as an integral part of another word, probably of the verb, rather than as a separate word. Such combinations as *to go* and *to dress* may be heard so frequently by the child that the words, through association, are considered integral.

FACTORS INFLUENCING LANGUAGE DEVELOPMENT IN THE CHILD

Language Development and Intelligence. Although the exact relationship between language development and intelligence is obscured by the large and important part language tests play in tests of intelligence, there is little doubt that the more intelligent children have richer vocabu-

laries and in general a better control of language than normal and dull children. It is our belief that children are not more intelligent because they have this control, but rather that intelligent children are able to develop and establish a superior control of language. Hildreth [6] demonstrated this in a study in which she compared the abilities of gifted children in both verbal and non-verbal situations with the abilities of average children in the same test situations which comprised the Pintner-Patterson Performance Scale, the Goodenough Drawing Test, and the Stanford-Binet Intelligence Test. The gifted children were found to be superior to the average children in both the verbal and the non-verbal tests.

Further evidence of the important relationship between intelligence and language development comes to us through studies of the mentally deficient. The mentally deficient child begins to talk about a year later than the mentally normal child. Boys, however, whether normal or feeble-minded, learn to talk later than girls. The following table adapted from Mead [7] compares the ages at which normal and feeble-minded boys and girls begin to talk.

When we consider that it is difficult to get accurate records of the accomplishments of dull children because parents tend to improve upon their accomplishments, the differences shown become even more significant.

Language Development and Economic Status. McCarthy found that children of parents in higher occupational groups (e. g., professional and managerial) are superior to those of parents in the lower occupational groups (e. g., semiskilled and unskilled labor) in language development.

[6] G. Hildreth, "Mental Ability Measured by Verbal and Non-Verbal Tests," *Teachers College Record,* Nov. 1932, 134–143.

[7] C. D. Mead, "Age of Walking and Talking in Relation to General Intelligence," *Pedagogical Seminary,* XX, 460–484.

COMPARISON OF NORMAL AND FEEBLE MINDED BOYS AND GIRLS AS TO AGE AT WHICH TALKING BEGAN
[Adapted from Mead]

NORMAL BOYS (23)

Age in Months	*Number of Children at Each Age*
9	2
10	2
11	1
12	1
13	1
14	1
15	3
16	2
17	2
18	3
19	1
20	2
21	1
22	1

Average age—15.76 mos.

FEEBLE MINDED BOYS (56)

Age in Years	*Number of Children at Each Age*
1.0	5
1.5	6
2.0	11
2.5	1
3.0	12
3.5	2
4.0	7
4.5	2
5.0	4
5.5	0
6.0	2
6.5	0
7.0	1
7.5	0
8.0	1
8.5	0
9.0	2

Average age—3.28 yrs.

NORMAL GIRLS (23)

Age in Months	*Number of Children at Each Age*
9	1
10	3
11	0
12	4
13	0
14	3
15	2
16	3
17	3
18	3
20	1

Average age—14.88 mos.

FEEBLE MINDED GIRLS (36)

Age in Years	*Number of Children at Each Age*
1	4
1.5	3
2	11
2.5	1
3	7
3.5	0
4	0
4.5	0
5	1
5.5	6
6	1
6.5	0
7	2

Average age—3.11 yrs.

The possibility that this difference can be explained by differences in intelligence between the two groups was tested in a study in which the mental ages of the children of higher and lower occupational groups were held constant. Despite this the children of the higher occupational group maintained their superiority in language development. The likelihood is that such children are exposed to a better language influence at home and reflect this influence in their vocabularies.

Vocabulary and Mental Age. McCarthy and others found positive relationships among: (*a*) the total number of words used; (*b*) the total number of different words used; and (*c*) the mental level of the speaker. The following tables adapted from McCarthy,[8] show the average total number of words and average number of words used by children at each mental age from eighteen months to seventy-eight months.

MEAN NUMBER OF WORDS USED AT EACH M.A.*

M.A.	*Boys*	*Girls*
18	9.6	29.3
24	46.5	60.3
30	112.9	124.6
36	169.8	207.7
42	173.4	181.4
48	228.7	198.4
54	239.2	266.8
60	234	235.3
66	231	244.8
72	—	246.5
78	—	292.5

MEAN NUMBER OF DIFFERENT WORDS USED AT EACH M.A.*

M.A.	*Boys*	*Girls*
18	3.0	8.7
24	15.3	11.6
30	21.6	18.4
36	28.6	45.2
42	37.1	35
48	48.2	42.9
54	46.7	49
60	50.2	71.7
66	87	67
72		84.5
78		90

* Mental Age.

A steady increase in number of words may be noted for both the boys and the girls, and also, that girls continue to

[8] D. McCarthy, *op. cit.*, p. 121.

be more advanced than boys in the matter of number of words used through the fifth year. After that the differences tend to be of no significance. If we consider once again the parts of speech or word categories based on the total number of different words used (table p. 130), we note that the large percentage of nouns is characteristic of the children in the lower mental levels. There is a decreasing proportion of nouns through the fifty-four-month level. The percentage of verbs steadily increases from the eighteen-month level through the fifty-four-month level. The same tendency may be noted for adjectives, adverbs, pronouns, conjunctions, prepositions, and interjections. In the use of all these word categories the girls are slightly though not significantly more accelerated than the boys.

CHAPTER TEN

DISORDERS IN THE SPEECH OF CHILDREN

Thus far in this volume we have traced the development of speech in the race and then, more particularly, in the infant and child. We have been concerned with normal speech and language. We shall now turn our attention briefly to a study of the more prevalent types of disorders in children's speech.

Incidence of Disorders of Speech

According to the White House Conference Report [1] about 1,000,000 children between the ages of five and eighteen were so defective in their ability to speak as to require remedial treatment and training. In New York City alone about 50,000 children, almost 5% of the school population, were found to be defective in speech. The mean per cent of speech defectives in the school population of forty-eight of the larger cities in the United States was discovered to be 6.9.

Relationship of Speech Disorders to Other Disorders

Although disorders in speech may be found on any level of intelligence, there is a greater incidence of disorder among the mentally defective than among the mentally normal. We find also an increased percentage of speech disorders among the physically defective. Frequently the cause of the physical defect is also the basic cause of the speech defects. Such physical abnormalities as tongue tie, hare lip,

[1] "White House Conference on Child Health and Protection," *Report of the Committee on Special Classes, Special Education* (D. Appleton-Century Co., 1931), p. 353.

split palate, and malocclusion are likely to be direct causes of speech disorders. Blindness and deafness are indirectly responsible for voice and articulatory defects common among the blind and deaf. Disorders in speech may be associated with alterations in personality, and may be either transitory or permanent. Rapid, slurred speech, peculiarities of voice, and the use of special words and locutions frequently reveal the existence of a personality disorder.

Functional and Organic Speech Disorders

Speech disorders may be classified under two major headings: (1) those which are fundamentally physical or organic in origin and (2) those which are psychogenic or functional in origin. Classification is not always easy because there is probably no case of speech disorder either completely organic or completely functional in origin. When no apparent organic or physiological cause can be discovered we assume the speech disorder to be functional and psychogenic. When we realize that we have only a limited ability for discovering the origin of physical or mental ailments we should proceed with caution before labeling any speech disorder as functional. Disorders such as stuttering and aphasia are in some cases difficult to classify. In general, however, we may say that if the disorder in speech is associated with disturbances which are basically emotional, if the case history of the patient reveals a psychoneurotic personality, if the patient's difficulty fluctuates in severity, and if the fluctuations are concurrent with emotional rather than physical disturbances, the disorder is fundamentally psychogenic. If the speech disorder never is exhibited unless associated with a physical defect, such as an organic spasm of nervous origin, or a defective organ,

we may consider the disorder basically physiogenic. Sometimes, however, a disorder may be physiological in origin but continue after the physical causes have been remedied. Wherever we cannot decide upon a classification we may term the disorder as psycho-physiogenic. From the point of view of therapy the third classification is perhaps the safest because in almost all cases, whether organic or functional in origin, some psychotherapy will have to be used with the patient. On the other hand even though a disorder may be basically psychogenic, treatment should include organ retraining.

Types of Speech Defects

There are four general types of speech defects found among children: (1) Stuttering (stammering), which includes defects in rhythm of speech, intermittent blocking of speech sounds, hesitation, and repetition of sounds once initiated. (2) Articulatory defects, which may result in making the child's speech indistinct or confusing because of a failure or an inability to produce the commonly accepted speech sounds. Articulatory defects include lisping, lalling, cluttering, and sound substitution. (3) Disorders of voice, which include any failure to produce smooth, even vocal tones sufficiently audible to meet conversational needs. Huskiness, shrillness, weakness, and nasality are examples of voice defects. (4) Aphasias, which may be defined as disturbances in the associational speech mechanism. Any failure to make instant association between and among the following constitutes an aphasic disturbance:

1. Hearing of speech sound and its meaning.
2. Graphic symbol of the sound heard.
3. Articulation of the sound heard.
4. Writing of the sound heard.

In children aphasias may be manifest in slowness of language learning. The child of two who seems to be physically and mentally normal, without any defect in hearing, but whose speech is nevertheless delayed should be suspected of an aphasic disorder. Aphasias are of course much more easily discerned if an associational disorder appears after apparently normal language ability has already been demonstrated.

Defects in Speech Common to the Small Child

It will help us, before we consider any of the major speech disorders, to examine the speech of a small child, one about two years of age. The speech of a two-year-old child will reveal an array of errors and faults any one of which, for an older child or an adult, would constitute a definite speech disorder. The two-year-old, if he is not considerably below the average in mental and physical development, and has taken the trouble to learn to speak or vocalize his wishes, is very likely to lisp. His sibilants will either be made with a lingual protrusion, or else perhaps a *t* or *d* substituted for them. Sometimes both sibilants and substitutes may be entirely missing. Guttural sounds are also likely to suffer, with dental substitutions frequent (*dood* for *good* is a common substitution). The small child's speech is apt to be characterized by the effects of assimilation – one sound influencing and distorting a neighboring sound. One twenty-month-old girl insisted that her dolly "kucked her bumb (sucked her thumb). The *k* in "sucked" influenced the pronunciation of the first sound; the bilabial *m* in "thumb" similarly changed the first sound of that word.

A small child is very likely to transpose sounds within a word. A *wasp* will become a *waps,* and *posts* will become

pots; ask frequently becomes *aks*. Such errors of transposition are known as metatheses. The elements of two words may frequently be combined and pronounced as one word (contamination), as *picat* for *pussy cat,* and *bigirl* for *baby girl.*

The types of errors just illustrated give us no cause for concern when committed by a two-year-old. The child learned these faults – errors in the adult sense only – along with many other words which might have been accepted as correct by adults. He learned the faults because words or word complexes uttered by the child, even when they included faults, brought forth a response which the child considered desirable and satisfactory. The pleasurable aftereffect attached itself to the connection or association "word uttered"→"desired environmental response."

Learning a Speech Disorder

We have seen (see chapter 5) that through the functioning of rewards, words are learned, meanings developed, and a language acquired by the maturing child. We have pointed out that not always is the learner aware of what he is learning, or just how the learning is taking place. An unwitting learner, such as our two-year-old child, may, if he is fortunate, learn to make many connections and associations which from the point of view of his environment are desirable; if he is less fortunate, he may form many undesirable connections and responses which may become an integral part of his repertoire of associations. Thus, he may learn to speak correctly, perhaps without even the errors typical of early speech, or he may learn to speak incorrectly. Incorrect speech may include the language elements, such as ungrammatical forms; or the speech elements such as

faulty articulation including lisping, lalling, slurring; faulty intonation; stuttering; and perhaps even an absence of vocalized speech.

A speech fault may become fixated even though it is not part of the sound complex which brings about the pleasurable response. If the sound complex containing the speech fault happens to be close in time to the rewarded sound complex, fixation of connections may occur through the influence of the spread effect of reward (see pages 65–68). Rewards which are highly specific, which are inherent in the result of a completed connection, and which are therefore informational are less likely to "spread" to other connections; but such rewards occur only rarely in the environment of the child. Even when rewards are directed by the adult, they are likely to hit fairly wide of their mark. The mother who gives her child an extra big hug because the child has imitated perfectly something she, the mother, has done, forgets in her loving moment that the child also may have *said something* during the imitation which was only a poor approximation of what the mother had said. The hug (reward) in the child's mind becomes attached to both the saying *and* the doing, though the mother intended it only as a reward for the doing. Frequently mothers, and occasionally fathers, become demonstrative to their children in order to please themselves. But the child does not know this. The token of affection, the pleasurable feeling tone, may therefore become attached to something the child has just said or done, or the *manner* in which something has been said or done, and that act or expression strengthened without such being the intention of the parent, and without awareness on the part of the child. Thus, the after-effect of the reward, functioning all too frequently in a hit-or-miss fashion, and spreading to connections which may not even

be logically associated with the rewarded connection, may result in the learning of faulty sounds, incorrect sound complexes, incorrect grammatical constructions, the adoption of unusual and incorrect intonational patterns and possibly even such major speech disorders as stuttering and aphonia. The case study below illustrates the unconscious learning of a speech defect.

Case Study to Illustrate the Learning of a Speech Defect (Dysphonia)

A dull, eight-year-old boy was brought to a speech clinic because of a persistently hoarse voice. Inquiry revealed that the child, the last of six, was a late walker and talker. His behavior had always been a mild source of annoyance to his parents, especially to his mother, who was usually too busy with her household duties to pay much attention to him. One day, about six months before his appearance at the speech clinic, the boy was misbehaving especially badly. With dispatch and thoroughness the mother began to spank him. The child accordingly cried loudly and lustily, but the mother continued with her spanking. Suddenly the child stopped his crying and began to whimper hoarsely. This so frightened the mother that she ceased the spanking. The child, however, continued his hoarse, whispered whimpering. Finally he stopped crying, but his speech continued to be whispered. The frightened and worried mother, in an effort to make amends for the spanking she had given the boy, presented him with cookies and showered him with the attentions of which ordinarily he had been deprived. The whispered speaking continued up to the time the child was brought to the clinic.

The case was diagnosed by the clinician as neurotic

hoarseness. Treatment was simple. The child was told to whisper a "magic incantation" which would restore his voice. At the end of the incantation the child, his mother, and the clinician were all to shout in unison "One, two, three, I am all better." All three shouted and all three felt better. The child heard his own healthy shout and was convinced that he was cured. The mother, too, was convinced that the child was cured, though for the moment the nature of the therapy puzzled her. The clinician knew that the child was cured, from this specific neurosis at least.

The child, without being aware of it, had learned that hoarse speaking was more profitable and more pleasurable than voiced speech. His hoarseness brought him cookies and attention, while voiced speech brought him little better than neglect, or at best the attention of a spanking. Thus, the after-effect of a reward unwittingly given by his mother and received by the child, resulted in a case of dysphonia.

PART IV

PERSONALITY AND SPEECH

CHAPTER ELEVEN

THE SPEECH PERSONALITY

What is Personality? When we use the term *personality* we probably have in mind the effect which an individual's total behavior has on us. A personality may be said to be the totality or pattern of the reactive possibilities of the individual. A personality exists only in relation to an organism behaving in an environment. It is important for us to remember that the personality is *not* a spiritual something which emanates as a disembodied essence from the organism of the individual. The personal reactions of the individual (his personality) are determined by interactions between himself and his environment; they are an expression of his complex organism reacting to a complex environment of which his own organism is an integral part.

The Development of Personality. The development of personality consists essentially of the adjustments made by persons to their environment. Our personalities begin to take form when we make our first adjustments to the world into which we are born. At the moment of birth we respond to our environmental influences by crying. Then our personalities are rather indefinite and nondescript. The crying of one infant sounds much like the crying of another. The infant's responses to stimuli are characteristically undifferentiated. The total organism enters into and responds alike to every stimulus without regard to its particular nature or source. And yet, indefinite as it is, the personality of the individual begins in infancy and, as Ellwood Murray points out, it "remains the same personality with respect to many

major characteristics to the time of death, regardless of the new powers it takes on." [1]

Factors of Personality. The factors of personality – the powers that determine the nature of our adjustments – lie partly in the individual and partly in the environment. The inherited factors that lie within the individual have only potential power; their functional value can be appreciated only when there is some interplay between them and environmental influences. Among the inherited factors that determine the nature of our adjustments and hence our personality are mental capacity and intellect, bodily build and general appearance, and temperament. We must recognize and realize that each of these factors is highly complex and is really nothing more than a convenient heading which includes many variables somehow related so that they can properly be included under one rather than another classification. Let us now consider the roles played by each of the innate factors of personality.

1. Intellect. The intelligence or mental capacity of a person is of fundamental importance in the development of his personality. The intelligent individual can control and direct his behavior before others by imagining the effects of his acts before the acts are performed. He is better able to understand what people expect of him and to behave in the light of such expectations. Though a less intelligent person, and even a person of definitely inferior intelligence, may be trained to behave in certain socially acceptable ways in given situations, the training will not result in generalizations and modifications of behavior such as are needed in meeting new or altered situations.

Superiority of intelligence has some drawbacks in regard to the adjustment problems of the individual. The bright

[1] E. Murray, *The Speech Personality* (J. B. Lippincott Co., 1937), p. 9.

person is not apt to be happy in performing routine tasks; he is likely to make heavy demands on his environment for changing stimulation, demands which the environment may be unable to meet. Restlessness, irritability, and ultimate indolence may be the results of conflict between the increased demands of a superior intelligence and an environment not equal to such demands. Maladjustments arising from such conflicts are frequently evidenced in school situations. Bright children sometimes become "bad" children because the routine school work fails to interest them and they seek other interests in the forms of mischievous activities and daydreaming.

2. *Bodily Build and General Appearance.* A handsome or a tall person, regardless of what he may do or say, will cause people to react to him in ways which are not the same as they would be were he homely or short. The attitudes which are assumed toward us because of our physical appearance affect our adjustment tendencies toward the people in our environment. If people expect us to assume leadership because we look tall and strong, we try, consciously or unconsciously, to play the role of leader. On the other hand, people of small physique are expected to submit to others, and are apt therefore to become submissive unless, as a compensatory mechanism, they become aggressively assertive. In any event, the factor of size is influential in determining behavior tendencies.

3. *Temperament.* The ancient Greeks and medieval physiologists believed man to be made up of four humors or liquids; if the humors were tempered in equal parts man was of even temperament; but if one humor exceeded the others, the individual was held to be somewhat peculiar. If, for example, *sanguis* or blood predominated, man was considered sanguine; if *phlegm* prevailed, man was con-

sidered phlegmatic; if *melanchole* or black bile was disproportionately strong, he was believed to be melancholy; if *cholé* or bile prevailed, he was deemed choleric. The term *humor* came to mean eccentricity, a personality type determined by the physiological make-up of the individual

Though today we consider the "humorous" explanation of temperament inadequate and unscientific, we still are in search for the physiological basis of temperament. Some of us believe that we have found the explanation in the glandular products of the human organism. (See pp. 48 ff.) The endocrine glands which discharge the products known as hormones directly into the blood stream are believed to be of fundamental importance in controlling behavior. Hormones are said to determine not only the physiological functions of the individual, but also his personality make-up.

Experimental evidence is piling up which tends to prove that the endocrine glands are responsible for maintaining the internal dynamic equilibrium of the individual. Proper glandular functioning is necessary for the balanced functioning of the organs of the body. We do not as yet know the exact nature or the specific function of each endocrine gland. Just exactly what contribution each glandular product makes to the welfare and efficient operation of the integrated organism is still obscure. But we do have evidence to show that the personality of the individual is decidedly modified if variations occur in the functions of the endocrine glands. For example, disturbances in the functioning of the pituitary gland have marked effects on the growth of the organism. A reduction in the activity of the thyroid gland brings about metabolic changes leading to decreased bodily activity, depression, and intellectual dullness. An overactive thyroid, on the other hand, tends to

make an individual extremely active, restless, irritable, and tense. Malfunctioning of the parathyroid glands, which are concerned with the regulation of the calcium content of the system, also may alter the emotional behavior of the individual.

Environmental Factors in Personality Development. The greatest environmental adjustment the individual ever has to make takes place at the moment of birth. The change from the life within the womb to the life outside is made easy for the individual because he is not expected to do anything about it himself and the people in the infant's environment do everything they can to help him. His wants, needs, and recognized desires are fulfilled with almost no effort on his part. As the child matures, less is done for him and more is expected of him. Other children, and even adults, oppose their wills to his. In this opposition of wills adjustments have to be made. The nature of these adjustments is determined by the inherited and developed tendencies of the child and in a large part also by the way older members in the child's environment assist him in the process of adjustment.

With developing maturity, continued adjustments have to be made. Entrance into primary school, and later into higher educational institutions, perhaps away from home, requires difficult adjustments. The choice of, and entrance into, a vocation is another adjustment milestone. Marriage and parenthood necessitate adjustments on the part of the individual which are extremely difficult and not always successful. In all these types of adjustments the environment of the individual may make demands which conflict with his own. It may happen that the environmental demands are too severe, just as it frequently happens that the individual's demands on his environment are excessive.

Adjustments can take place only when there is an equalization between the demands of the individual and those of the environment. This process may necessitate compromise. Fundamentally, the ability to make adjustments will be determined by the traits the individual has developed as a result of the interaction of his innate personality factors and his environment.

Personality Types

It would be pleasantly convenient if we could classify people clearly according to personality types. Most of us like to classify; we think of people as good or bad, handsome or homely, stupid or bright. Unfortunately, we cannot do this for personalities. People tend to remain tall once they grow tall, and strive to remain handsome if they are so born, but they do not seem to be content to have their personalities otherwise remain definite in character and permanent in structure. The personality pattern is ever changing, though the nature and direction of the changes are influenced and largely controlled by the innate factors that determine adjustments: intellect, physique, and temperament.

If we wish, we may think of personality types as ideal abstractions under which we can classify individuals if their personality patterns are at any time in keeping with the characteristics of the type. Let us bear in mind, however, that any individual may at one time present one personality pattern and at another time, under altered circumstances, another pattern. Moreover, we should realize that most individuals tend to persist in an established pattern so that generally the total effect of their behavior makes classification, if it is not too rigid, more possible than it might otherwise seem.

Introversion and Extroversion. Perhaps the most widely spoken of personality types are those known as the introvertive and the extrovertive. The introvertive person is one whose interests are inwardly directed, who is largely concerned with his own thoughts and desires. He is likely to be moody, reserved, and highly introspective. Further, the introvertive individual is apt to be absent-minded and given to daydreaming. On the other hand, the extrovertive individual is interested in external things, in objects outside of himself. The extrovert is not given to introspection and daydreaming but rather to action. In between the two extremes of extroversion and introversion is a group much larger than either extreme – the ambiverts. The ambiverts are neither strongly introvertive nor strongly extrovertive, but a little of each, some tending more to one extreme than others.

Cycloid and Schizoid Types. Another classification of individuals is into cycloid and schizoid types. Kretschmer [2] believes that there is an inherent correlation between body build or physique and personality type. He believes that the well-rounded, heavy built, pyknic type is more apt to be extrovertive and, in extreme cases, manic; the thin, tall, frequently weak individual is apt to belong to the introvertive type and, in extreme cases, to be schizophrenic. The behavior of the normal cycloid is suggestive of the behavior of the manic-depressive. Cycloids go from an excited stage to a depressed stage, frequently with a long intervening level stage of behavior. The normal introvert's behavior may also be said to suggest the behavior of the schizoid. The introvert is a withdrawn person, but his withdrawal is never as complete as that of the schizoid, who apparently pays

[2] E. Kretschmer, *Physique and Character* (tr. by W. J. H. Sprott, Harcourt, Brace and Co., 1925).

little or no attention to his environment and frequently sets up mental barriers which make ordinary social contact impossible.

Perseveration. Perseveration is the tendency of ideas to persist or remount into consciousness spontaneously after they have once occurred. All of us perseverate on occasion; the recurrence of a tune or jingle, the sensation of being on roller skates after the skates have been removed, the persistent feeling of "sea legs" on land, are common and normal examples of the perseverating tendency. In some persons, however, mental processes tend to persist for an abnormally long time after the cessation of the stimuli which gave rise to them. Spearman,[3] who has investigated the perseverating phenomenon, believes that perseveration tends to increase along the lines manic – normal – melancholic. He feels also that there is a greater tendency for the male sex to perseverate.

It is not difficult to see the possible relationship between perseveration and introverted behavior. Ewen,[4] who investigated the perseverating phenomenon in normal and epileptic patients, found it to be a feature of the peculiar mental state of epileptics between attacks. Pinard [5] found that perseverators tend to be abnormally nervous and sensitive.

Though it is possible for us to continue adding to the list of personality types under which people might be classified, little will be gained by such additions. It is probably of greater importance for us to remember that pure person-

[3] C. E. Spearman, *The Abilities of Man* (The Macmillan Company, 1927), chap. XVII.

[4] J. H. Ewen, "Perseveration in the Insane Epileptics," *Journal of Mental Science*, LXXVI (1930), 537–540.

[5] J. W. Pinard, "Tests of Perseveration – II," *British Journal of Psychology*, XXIII (1932), 114–126.

ality types really do not exist, or if they do, they seldom remain pure for any length of time. The same individual varies in his personality pattern from time to time. Under one set of circumstances he may seem to be depressed, markedly withdrawn, and a perseverator. In another situation he may tend toward the manic and behave like an extrovert. We may be able to stabilize the characteristics of hypothetical personality types, but the individuals we place under each classification may not be reconciled to remaining fixed in type!

The Development of the Speech Personality

From the very beginning of the child's conscious life, acts of behavior are accompanied by speech activity. At first the speech activity is as undifferentiated as the rest of the behavior, and is a mere by-product of the reflexive total bodily movements. In early childhood, speech accompanies most acts of behavior. Later, with further growth and maturity, speech frequently becomes a substitute for direct, overt behavior. The speech development of the individual parallels and reflects his intellectual, emotional, and physical growth. Nearly every conscious act of the person is verbalized, so that his speech represents a condensation of his entire cultural development; it is in effect a symbolization of the person's experiences resulting from the interactions of his innate tendencies and environmental influences.

Because the entire person is involved in every speech act, speech reveals the state of the person at any given moment. The person is as he speaks. We may

> envisage the speech skills and speech personality as the result of a long growth process, steadily differentiating and

> expanding under a unified behavior pattern. An unusually high level of speech proficiency, a superior speech performance, therefore implies a greater degree of differentiation, a more mature development and growth, a further evolving of controls over more and more refined and exact speech skills and techniques.[6]

When mental and physical maturation progress smoothly, speech will develop steadily and evenly. Disturbances in mental or physical development, temporary or permanent, will be reflected in the individual's speech. Because continuous, undisturbed physical and mental development is rare, continuous, and unimpeded speech development is exceptional.

Perfect speech – assuming for the moment that perfection in speech is achievable – requires perfect co-ordination of activity among all the organs of the speech mechanism. The receptive mechanism, concerned with seeing, hearing, or feeling word symbols; the motor mechanism, including the organs of the larynx, tongue, lips, etc., concerned with producing speech sounds; and the intellectual mechanism, concerned with making necessary associations between the motor and receptive systems must all work harmoniously and co-ordinately. A disturbance in any of these mechanisms – and the possibilities for such disturbance are myriad – will result in a disturbance in speech. Few people are able to maintain perfect co-ordination at all times. Almost all of us are likely to err in our production of speech at some time. The errors may be slight and infrequent, consisting only of a sound substitution or inversion, a momentary blocking, or a slurring of a sound. Perhaps, under emotional strain we "forget" the word we really want to utter and substitute another word. The variety of slight and

[6] E. Murray, *op. cit.*, p. 10.

transitory speech disturbances is great among normal, fairly well integrated persons. The degree and variety increases among persons whose physiological and mental mechanisms are not well integrated and co-ordinated.

Pathological Speech

Why We Study Pathological Speech. Our main purpose in studying pathological speech is better to understand normal speech. The relatively normal individual is so much with us that we seldom pause to study him, and we hardly appreciate how truly remarkable a creature he is. But all of us pause when confronted with the abnormal, the pathological, and because we do, we are able to learn something (though the method is indirect and analogical) of the workings of the normal human mechanism. When the clock stops or runs fast and we tinker with it, we learn something about what makes the clock go in the first place. If the clock were to behave perfectly we would be likely to ignore the mechanism of it, content with leaving well enough alone.

Effects of a Pathological Condition on the Activities of the Individual. A pathological condition diminishes and simplifies the activities of the affected organism. The greater the degree and extent of defect, the simpler the type of response, even though the response, because of its very simplicity, seems bizarre. The comparative simplicity of response in the pathological is fortunate for the student because it reduces for him the difficulty of understanding the functioning of the human organism.

The convalescing organism is of further use to the psychologist and psychiatrist. Healthy human beings cannot for long be isolated and controlled for the purpose of studying their behavior and their methods of adjusting them-

selves to their environment. Even the small child has experiences of which the adult is not aware, and which the adult consequently cannot evaluate in his efforts to determine the whys and wherefores of a child's development. But the sick organism can be isolated, and, if necessary, continually observed. Students can study the ways and means of adjustment which the convalescing organism adopts. From such study they can draw conclusions which are generally applicable to normal human behavior.

The Relationship Between Organic and Psychogenic Changes. An individual's personality, we have decided, may very well be considered the sum total of his reactions. If anything happens to a person to change his method or manner of reacting the result is a different personality. When an individual undergoes a marked change as a result of an organic injury or a functional disturbance, a new personality arises because his behavior patterns have been modified. This new personality is nowhere reflected as well as it is in speech. The individual problems of a pathological person remain unchanged; his method of handling his problems, his tools of adjustment (which constitute the personality) are affected and are different. His spoken words, the most potent and frequently used of a man's tools of adjustment, are likely to undergo radical changes which are of major interest to us.

A complete treatment of pathological speech should include the entire array of disorders of speech to which men are heir, and which we have outlined in a previous chapter (see page 137). Mild disorders, trivial and transitory defects, should all be considered. This, of course, is not possible within the limits of this volume; nor is it really necessary. Though a mild, infantile lisp on the part of a newly-married woman, or on the part of a middle-aged matron

who feels that her youth has slipped away, may be indicative of peculiarly interesting personality changes, the ubiquity of such disorders makes us unable to appreciate their significance. So also with the strident voice or the whining voice. They are so much with us that we accept them as a normal part of our lives. We become so immune to such mild disorders that we tend to overlook their importance. A disorder in the use of speech of any type or degree, reveals a disorder in personality. Let us bear in mind, however, that our fundamental interest is in normal speech. We seek to shed light on the usual by putting the spotlight on the unusual. We shall begin our study of personality changes and their influence on speech by a consideration of the blind who, of necessity, differ from normal people in their social and physical development.

CHAPTER TWELVE

PERSONALITY DEVIATIONS AND SPEECH

THE BLIND

What is a blind person? Is he like a seeing person except that he lacks sight, or is he really a different person? Blindness is more than an absence of vision, more than an impairment or loss of one sense. The loss of vision, the closing of this avenue of sensory stimulation affects the organization and development of the entire life of the blind person – mentally, physically, and socially.

Physical Development and Health of the Blind. Though the general health of the blind differs little from that of the seeing, there are differences which should be noted and the reasons for the differences should be thoroughly understood. Those who have become blind congenitally may also have a general lowered resistance to disease which impedes physical development along normal lines. The disease causing the blindness in this case is also the cause of the continued lessened ability of the individual to resist disease. Similarly, adventitious blindness is likely to be accompanied by general ill health, unless of course, the blindness is the result of an accident. The general ill health of the individual is a contributory factor to the development of blindness. So, whether the blindness is congenital or acquired, the blind person is more likely to be in a poorer state of health than the seeing person. The less robust state is also more likely to continue with the blind than with the seeing. Blind people do not have as much opportunity for physical activity as the seeing. As a result their muscles lack

tonicity, and they are likely to be flabby and sluggish in their reactions.

Social Environment of the Blind. The entire sensory organization of the blind person is such that of necessity he must become egocentric. From the very beginning, stimulation is primarily through the sense of touch. Objects touched include himself, his clothes and bedding, people and articles brought to him. For a long time, beginning as soon as the infant is able to differentiate between his own body and the mass of clothing in which he is swathed, the child's body is itself a large and very important part of his environment. The body during this time is both the source and the object of stimulation. This almost unpreventable preoccupation of the blind child with his own body constitutes a very real danger which can be avoided only by providing him with sufficient tactual stimulation from other sources. Unfortunately, the blind infant cannot be permitted, because of physical dangers, to seek his own sources of tactual stimulation. So, from the very beginning, the blind person's social and physical world is organized to center about him. Generally this type of organization continues throughout adulthood.

During the childhood period, social activities within the home center about him. It is easier for members of the family group to arrange themselves about the blind child than for him to join their group. The family's games, its parties, almost all its social activities are specially arranged with the blind child in mind. Errands are run for the blind child, he is not expected to run them for others; gifts are brought for him and to him, rarely does he buy them for others. Because the social activities center about him, the blind child has a very limited insight into broader social relationships. He is not apt to know how the members of

his family or how he himself might act in outside social situations.

As the blind child matures he may become cognizant of social problems which may arise in his family because of him. He may become aware of himself as the cause of family distress, and he may begin to realize that he is circumscribing the family's activities. This knowledge may sometimes make of him a tyrant drunk with the sense of his power over the persons in his home. On the other hand, the child may share in their distress but because he is unable to do much to relieve it he may become morbidly depressed. The realization of his dependence upon others may also result in a depressed emotional state.

Another factor tending to make for a peculiar social development in the blind is the likelihood that the family will adopt an habitual attitude toward him not adopted toward other members of the group. He is likely to be over-indulged and spoiled, be relieved of all responsibility, but still be the recipient of all favors. Occasionally, of course, the family members may ignore him almost completely to defend and protect themselves. In either case the blind child suffers because he lives in a social environment that is unchanging and peculiar to himself.

Intelligence of the Blind. The blind tend to fall slightly below the norms of the seeing in intelligence even when measured by tests such as the Hayes Revision of the Stanford-Binet standardized especially for the blind. An absolute comparison between the blind and the seeing is impossible to make because certain tests, such as color recognition and picture explanation, of necessity have to be omitted from the Hayes standardization. Despite this, it is probably true that the blind are, as a group, slightly less intelligent than the normal seeing. A partial explanation

for this may be found in the influence of the disease which was the cause of blindness on the general mental ability of the blind. Blind people are not less intelligent because they are blind, but rather because the affliction which resulted in their blindness also caused dullness. The relationship between blindness and lowered intelligence is one of concomitance and not of cause and effect.

Language Development of the Blind. The normally seeing child who acquires a vocabulary learns each word as it is accompanied by facial expression, arm and hand gestures, and general bodily activity. Indeed, he probably begins to understand verbal utterances because of their association with pantomimic movements which were first meaningful to him. These facial expressions, gestures, and gross bodily movements which accompany verbal utterances are psychologically not present to the blind child when he learns a word. The normally seeing child in learning the name of an object may touch it, see it, and if it makes a noise, hear it. But the blind child cannot see the object, and perhaps cannot quite comprehend what he feels. A thing seen, heard and felt is different from an object only heard and felt. Though both the blind child and the seeing child use the same name for the object, the concepts behind the name are different, and the mental reactions of the blind and seeing children to the name are necessarily different. Words used by normally seeing children are rich in meaning. Words recall not only their experience, but the experiences of others and their relationships to these experiences. For the blind child, however, words recall experiences related to his own environment in an almost exclusive way. The blind child's great degree of dependence on tactual stimulation makes his experiences and the words which stand for them narrower and inherently different from those of

the seeing child. But the blind are expected to use words as normally seeing people do. The blind are expected to name objects, to identify sounds and smells, to indicate relationships, even though they cannot fully understand the complete significance of these objects, sounds, smells, and relationships. Blind people, in short, are expected to pretend that there is no difference between their spoken words and the words of the normally seeing. The blind person's words are marked by verbal unreality. The peculiarities that arise from this unreal use of words we call *verbalism.* A blind student of the writer's presented a nice example of verbalism when he chose as a selection for an assignment in interpretative reading the poem beginning "My heart leaps up when I behold a rainbow in the sky."

The Voice and the Blind. The greatest part of what the congenitally blind ever learn comes through the medium of voice. The voice, both as a stimulus and a response, contains pantomimic meaning as well as oral meaning. All one says to a blind person is conveyed by means of the articulated voice. Irony, sarcasm, puns are apt to fall flat because they are literally interpreted, the denotative rather than the connotative meanings prevailing.

Vocalization for the blind plays an even more important role than does vocalization for the normally seeing. The blind person makes all his thoughts and feelings known by vocalized speech. When the blind speak they expand their ego; they are potent individuals manipulating and causing people in their environment to react to them. Cessation of vocalization results in a contraction of the self. Without voice the blind person becomes impotent, and he feels unimportant.

Psychological Causes of Speech Defects among the Blind. One might imagine that with the all-important role played

by speech in the life of the blind person, that he would exercise the utmost care in his speaking. But such is not the case. Although the blind person is sensitive indeed to the speech of others, his own is apt to be faulty. Several causes may be responsible for the defective speech of the blind. Perhaps the most primary of the causes is his own personality. The blind, as we have pointed out, tend to be egocentric, and hence are likely to overlook or to be entirely unaware of their own faults. Sometimes, even if the blind person is cognizant of his defects, he may indulge in their practice for the sake of the emotional gratification they afford him. Frequently, of course, the blind person may not be aware of his faulty speech. His parents and friends, because of his unusual position, may be unwilling to correct him. So, because he is more prone to detect faults in others than in himself, he continues to speak defectively.

Another of the important psychological reasons for faulty speech is the inability of the blind to analyze sounds heard. When a seeing person hears a sound he can also observe its production. Thus he has a twofold basis for analysis. The blind person can hear the sound but he cannot see *how the sound is produced.* Because of this partial sound analysis the blind tend to be faulty in their attempted imitation of the sounds of others. They need, therefore, more rather than less correction, which parents, friends, and even teachers are reluctant to give them.

Organic Causes. Among the underlying organic causes for the defective speech of the blind may be included somatic causes that frequently accompany congenital blindness or blindness acquired because of illness. Nasal, pharyngeal, oral, and laryngeal malformations, and poor neuromuscular control resulting in slow and uncertain reactions may be caused by such ailments as rickets, spinal meningitis,

and infantile paralysis. The lack of muscular stimulation because of the limited opportunities of the blind to indulge in physical exercise results frequently in poor muscle tone and general flaccidity. These organic deficiencies may make difficult or impossible the correct production of voice and speech by the blind.

Speech Defects among the Blind. The defects in the speech of the blind arise directly or indirectly from the peculiar personality of the blind. It is perhaps unfair to consider them as actual defects, for they are so much an integral part of blindness. When, however, we compare the speech of the blind with that of the normally seeing and judge their speech by that of people not deprived of sight, the blind are definitely defective in their speech. Some of the characteristic defects will now be considered together with their possible causes.

Voice. The blind person's voice is apt to be flat and monotonous and poorly modulated. The voice is frequently overloud, most probably because of the inability of the blind to localize the person addressed and to direct his voice at him. The flat, monotonous tones are caused possibly by the general lack of muscular tonicity which is characteristic of the blind.

Articulatory Defects. Infantile speech characterized by lisping, letter omission, and letter transposition is frequent among the mature blind. Their peculiar social position, the excessive petting and pampering they may get, and the unwillingness of seeing people to correct the blind lest their feelings be hurt are partly responsible for persistent infantilisms. The limited social contacts of the blind, and the likelihood of their association with other blind persons having similarly defective speech, together with their in-

ability or unwillingness to analyze and correct their own speech, make mistakes in articulation once acquired all too likely to persist.

Even should the blind become cognizant of their faulty articulation and desirous of correcting their speech they would still be beset with hindrances. Their muscular flaccidity makes rapid and precise articulation a difficult task. Much drill in articulatory exercises and a strong motivating drive must be furnished if they are to correct their speech faults.

The Stutterer

So much has been said about stuttering, so much written that is contradictory and recondite, that we approach the problem almost with trepidation. Let us first review what we are sure we know about stuttering and stutterers. Stuttering consists of involuntary, spasmodic repetitions of sounds, or of an inability to initiate certain sounds. The stutterer seems to be blocked when he speaks. Certain sounds,[1] or combinations of sounds, seem to be obstructed. The sounds most likely to be obstructed are those which are most difficult for two-year-old children to produce. Sometimes there is a blocking on any and all speech sounds. We are first likely to notice signs of stuttering at the age of five or six, just about the time the child enters school. Sometimes stuttering is observed to begin earlier, and frequently later. Occasionally, though rarely, stuttering does not begin until adulthood. Stuttering is about four times more frequent among boys than among girls. It is generally more

[1] G. Fairbanks (*Quarterly Journal of Speech*, XXIII [1937], 67–69) found that sounds which require constriction of the resonating cavities and precise, rapid articulation and phonation are most likely to cause difficulty for stutterers.

severe and lasts longer with boys than with girls. There are at least one million stutterers in the United States, most of whom are children attending the elementary and grammar schools. There are fewer proportionately in the colleges than in the high schools, and fewer still in the professional and graduate schools.

This is about the sum of what we are sure we know about stutterers. In addition there are a number of things we *think* we know about stutterers. These consist of findings of investigators about which there is fairly uniform but by no means unanimous agreement. We can divide these findings into three categories: the physiological, the psychophysical, and the psychological.

Physiological Symptoms of Stuttering. We will first consider the physiological or bodily symptoms which may be observed when the stutterer speaks. The stutterer is likely to be tense, his body sometimes becoming rigid. His muscular tension may be sufficiently great to result in spasms which affect his lips, tongue, and larynx. The stutterer exhibits peculiarities of breathing. His inhalations and exhalations are not properly timed. He may either hold his breath too long before he begins to speak, or else exhale and then try to speak when his supply of air is gone. The stutterer's breathing is lacking in rhythm. He often inhales when he should exhale, and exhales when he should inhale. Sometimes the stutterer interrupts an inhalation to exhale, or an incompleted exhalation to inhale. Normal speaking takes place when the speaker is emitting breath from the lungs, but the stutterer occasionally speaks while inspiring. In normal speech the ratio of inspiration to expiration is about one to five; the stutterer's ratio is approximately one to two. Finally, the stutterer wastes a great deal of breath before he has actually begun to vocalize; consequently,

when he is ready to vocalize he finds himself with insufficient breath, and vocalization stops short.

Psycho-Physical Symptoms of Stuttering. In addition to these physiological characteristics, there are related psychophysical characteristics which have been observed. These involve changes in blood distribution and heart rate. The blood changes are readily exhibited when the stutterer either flushes or becomes pallid. The pulse rate of stutterers has been found to increase from the normal seventy-two per minute to as much as one hundred twenty-nine per minute.

Psychological Characteristics of Stutterers. Psychologically, the stutterer is interesting because he seems to be somewhat different from normal people. Meltzer [2] found that stuttering children exhibit more definite introvertive and extrovertive traits than non-stuttering children. The stuttering child was also found to be more talkative than the normal speaking child. The writer [3] in an examination of the written speech of college stutterers, found that in written free association the stutterer is more "talkative" than the normal speaker, but that the stutterer becomes decidedly less talkative when he has to combine and arrange words into related thoughts, as in essay writing. The written speech of the stutterer is also more marked by trial-and-error response than that of normal speakers. In another study, the writer [4] found that stutterers manifest a definite tendency to perseverate. Perseveration as a personality trait has been generally neglected in investigations of stuttering,

[2] H. Meltzer, "Talkativeness in Stuttering and Non-stuttering Children," *Journal of Genetic Psychology,* XLVI (1935), 371–390.

[3] J. Eisenson, "Some Characteristics of the Written Speech of Stutterers, I," *Journal of Genetic Psychology,* L (1937), 457–458.

[4] J. Eisenson and E. Pastel, "A Study of the Perseverating Tendency in Stutterers," *Quarterly Journal of Speech,* XXII (1936), 626–631.

though given considerable attention in studies of other abnormalities such as epilepsy and manic-depressive psychosis. (See p. 152.)

Perseveration in Stutterers. Is the tendency of the stutterer to repeat a sound he has made a manifestation of perseveration? The production of a speech sound results from the excitation of a set of neurons. If this state of excitation were to continue autonomously, resisting change, the result would be either a repetition of the original sound produced or, if that is inhibited by the speaker, a blocking of further production of articulated sound. That stutterers do show resistance to changing stimuli, and a greater tendency for their neurons, once excited, to persist in their original state of excitation than is the case with normal speakers, was demonstrated by the writer.[5] In his experiment a series of tests was administered to a group of thirty male stutterers and a matched control group of thirty nonstutterers ranging in age from ten to sixteen. The test material and the experiment were constructed along these lines: (1) A situation was presented to which the subject was required to respond for a given length of time. (2) A variation of this situation was then presented to which the subject was required to make a different response for the same time period. (3) A third situation, consisting of the combination in random order of both original situations, was then presented. The subject was here required to change his reactions quickly and suddenly. Failure to make these changes was a failure in responding to a new situation. Failure meant that the subject continued to react to a situation which was no longer present; a mental process continued in activity after the situation which originally called it forth was no longer present. The results of this study re-

[5] J. Eisenson and E. Pastel, *op. cit.*

vealed that stutterers slowed down more than non-stutterers in those tasks which called for making adjustments to changing situations and that they made an appreciably larger number of errors while making these adjustments. When, however, the subjects were permitted to continue the same reaction to a non-changing situation, the stutterers worked more rapidly than the normal speakers. In another study, the writer and Winslow [6] arranged an experiment in which the subjects, a group of fifteen stutterers attending the speech clinic of their college, and a control group of fifteen non-stuttering students, were permitted to react to an original situation and then to variations of this situation. The original situation consisted of an arrangement of colored squares shown through the aperture of a tachistoscope. The variations of this original situation consisted of the introduction of new colors not presented on the first card, and the elimination of colors shown on the first and subsequent cards. The subjects in the experimental situation reacted to the colors by indicating: (1) The number of colors observed and (2) the different colors. The results proved definitely that stutterers as a group are more influenced by stimuli which were *once present* but which were *no longer physically present* at the moment of reaction. Stutterers continued to react to and "see" colors in new situations which were present only in previous situations. These findings indicate that the stutterers show a greater tendency to resist change, a greater tendency for their neurons, once excited, to persist in their original state of excitation than is the case with normal speakers. Stuttering itself is an indication of resistance to change, and

[6] J. Eisenson and C. Winslow, "The Perseverating Tendency in Stutterers" – Paper delivered before Eastern Branch, American Psychological Association, April 3, 1937.

hence a manifestation of the perseverating phenomenon.

It is now time to ask, since perseveration is so prevalent, and since stuttering (as we hold) is a manifestation of perseveration, why do not more of us stutter? The answer is, of course, that many of us do without being aware of it. Not all of us stutter while speaking, though many of us do when very tired. Some of us "stutter" in non-vocal activities such as writing, or even walking. All of us, except perhaps a saintly few, become highly irritable if when tired we are compelled to adjust ourselves to changing situations. Perseveration may indicate a lack of adaptability due to a lowered vitality. Perhaps, as Riese [7] suggests, the perseverating tendency protects a weary and protesting nervous system and prevents it from becoming completely enervated.

Having indicated the existence and the virtual universality of the perseverating tendency, we must now show how the tendency can become attached to the act of producing speech so as to result in stuttering. As we have already indicated, most children experience difficulty in the production of certain sounds and sound combinations. In general, the difficult sounds require for their production rapid and precise changes of the organs of articulation and intense and active use of the entire speech mechanism. Stuttering spasms are most likely to occur on these sounds. Stutterers, as we have said, are perseverators; they find it difficult to react rapidly and accurately to changing stimuli. When they are trying to speak they find themselves unable to use their speech mechanisms with the accuracy and precision of non-stutterers and so the speech of stutterers is characterized by spasms which are related directly to the

[7] W. Riese, "Über einige motorische Herd-Symptome," *Psych. u. Med.*, 1927, 172–183.

difficulty of the sounds produced, or perhaps *not produced.* Another very common phenomenon in the development of infant speech is the repetition of syllables. This tendency is most marked during the lallation and echolalic stages, and continues through the verbal utterance stage. If the child succeeds in getting what he wants from his environment by this sort of speech, it will become strengthened and habitual. We may call this type of speech initial stuttering. Let us suppose, however, that when the child is about four or five years of age, his parents decide that he has grown up and must begin to discard his "childish" habits. The child's natural tendency to repeat sounds or to be blocked on certain sounds now meets with disapproval from his environment; he no longer gets what he wants, though he may learn to enjoy what he gets, the attention of disapproval. If there is sufficient psychic compensation in the disapproval, if the child rather likes the idea of getting a "rise" out of his environment because of his manner of speaking, stuttering may continue unabated. If, however, the child wants the approval of his environment he may become annoyed and embarrassed by his repetition of syllables. The individuals in the child's environment, older playmates, parents, or teachers, as the case may be, may feel sorry for the child in his predicament and either supply the unsaid words or fulfill the child's unspoken but recognized wishes. The child, who has now become very much aware of his speech which is marked by repetitions and spasms, may begin to exhibit behavior patterns which indicate his awareness and betray his efforts to correct his speech. He may pause for an uncomfortably long time after he hears himself repeat a sound. He may, perhaps, try repeating the entire sentence in order to give himself a "fresh start" in the belief or hope that he will thus be able to "hurdle over"

the sound combination which may have caused him difficulty. Devices such as increasing the tension of the organs of respiration and articulation, or employing gross bodily movements, or peculiar head or hand movements may be indulged in while the stutterer is trying to speak. When these peculiar behavior patterns which accompany speech efforts become habitual, we have the completed picture of a fully developed stutterer.

The important point to note is that stuttering, whether it be "initial" or "developed" evolves along normal lines of learning; either type is the fruit of a natural tendency nourished and matured by the effect of rewards. Stuttering is for the perseverator as normal a manner of speaking as non-stuttering is for others. If we consider the stutterer to be a special type of personality, we shall be amazed by the comparative rarity rather than the frequency of stuttering.

The Manic-Depressive

Characteristics of Pathological Speech. Speech is most importantly used by man to make social adjustments, to elicit those responses from his environment which further his ends. Many functional and organic mental disorders betray a maladjustment, an inability on the part of the individual to live a proper social life in the environment in which he finds himself. This inadequate social adjustment is most clearly reflected in the abnormal use of the spoken word. In normal speech the speaker's use of words is influenced and checked by the auditor. In psychopathic speech, however, the normal checks which the auditor is expected to exert on the speaker are weakened or entirely non-existent. Variety of rate and utterance in normal discourse is determined by the auditor's ability to follow the

speaker's flow of words with ease, and without a feeling of either chaos or boredom. In psychopathic speech, however, the auditor may be ignored, or perhaps even scorned, by the speaker. The spoken words of the psychopath are symptomatic of a peculiar personality; they reveal and announce the existence of a diseased mind which has caused the personality.

1. The Manic. The cardinal symptoms of the manic stage of manic-depressive psychosis are exhaltation or excitement, accelerated flow of ideas, and heightened motor activity. Except during severe attacks, intelligence, consciousness, and memory are not likely to be affected. During severe episodes, judgment may be warped by illusions, hallucinations, and delusions.

The speech of the manic is symptomatic of his behavior. He is likely to talk incessantly and rapidly. The high tempo interferes with pronunciation so that sounds are slurred and many words are only partly uttered. The style of utterance is telegraphic; connecting words, particles, relative pronouns, prepositions, and adverbs are likely to be omitted. The manic's discourse is marked by flight of ideas. The subject matter is highly diversified, far in excess of the normal auditor's rate of absorption. The manic's speech is at first fascinating, but ultimately wearying. Little if any attention is paid to the auditor; the manic speaks to express his own emotional and mental state. The presence of an auditor serves as a stimulant for speaking rather than as a stimulant for specific utterance. The following specimen of manic speech will illustrate some of these characteristics.

Q. Why are you in the hospital?

A. I'm staying right here – they give me my meals and everything.

Q. Do you like to be here?

A. I like to be here. This is nice hospital.

Q. What was wrong with you?

A. Had cold in head – back hurting. Had instruments to head; born five days. Mother didn't tell me – couldn't go to school – staying in hospital, going home for Christmas. [In response to another child's presence in room:] There now – see – I'm a little sick – wasn't able to go to school this winter. Stay right here and get milk whenever I need it. Mother lives in Brooklyn – comes to see me – I can sit up – you know I can sit up. Been buying Christmas presents. Try to find my own.

Q. Can you read this book?

A. I can't – when I cough a lot I have a cold. Must keep the book neat – want to take it home.

Q. Tell me a story about these three dogs.

[Child concocts story based on appearance of dogs on cover of picture book. Story rambles on aimlessly.]

Q. Tell me a story about these dogs and nothing else. Don't tell me about other things.

A. Once there were two dogs who couldn't eat no bones – see – no bones. They went into ice box and got some meat – pork chops on toast. When the doggies came they had salmon to eat. The dogs had no mother. Lived in a little house in the woods.

2. *The Depressive.* The outstanding symptoms of the depressive stage of the manic-depressive psychosis are depression or dejection, retarded flow of ideas, and motor inhibition. Suicidal ideas frequently obsess the individual. He may have insight into his condition, and frequently orientation remains intact.

The speech of the depressive person, like the manic's, is symptomatic of his disorder. The slow rate is indicative of a general retardation of motor processes. The same thoughts are likely to be presented again and again; the consequential and the inconsequential, from the auditor's point of view, are offered as of like importance. Diversification of utter-

ance is extremely low, so that the auditor becomes quickly bored and seeks an escape. His efforts to change the direction of discourse are generally futile. The depressive patient speaks to express himself, rather than to elicit responses from his auditor. The tired, sad Dormouse whom Alice met at a tea party during her adventures in Wonderland presents an example of depressive speech.

> "They were learning to draw," the Dormouse went on, yawning and rubbing its eyes, for it was getting very sleepy; "and they drew all manner of things – everything that begins with an M—."
>
> "Why with an M?" said Alice.
>
> "Why not?" said the March Hare.
>
> Alice was silent. The Dormouse had closed its eyes by this time, and was going off into a dose, but, on being pinched by the Hatter, it woke up again with a little shriek, and went on: "That begins with an M, such as mousetraps, and the moon, and memory, and muchness – you know you say things are 'much of a muchness' – did you ever see such a thing as a drawing of a muchness?"
>
> "Really, now you ask me," said Alice, very much confused, "I don't think—"

The Schizophrenic

Clinical Types of Schizophrenia (Dementia Praecox). Four clinical forms of schizophrenia are generally recognized: (1) simple dementia, (2) hebephrenia, (3) catatonia, and (4) the paranoid form. Though each of the types is characterized by a special syndrome, we shall make no attempt to deal with the clinical types separately. Instead, we shall consider the symptoms and characteristics generally common to all types of schizophrenia [8] or dementia praecox.

[8] The term *schizophrenia* is currently preferred by clinicians and is replacing the use of *dementia praecox.*

The outstanding symptoms are: progressive deterioration of intelligence, judgment, insight, feeling, and emotion; the emotional and intellectual life generally show a lack of co-ordination. The disorder is retrogressive, earlier memories remaining undisturbed while memory for recent events is impaired. This peculiarity may be the result of defective attention to present occurrences rather than an actual impairment of memory. Delusions, hallucinations, and deprivation fancies are likely to be present. The hallucinations are usually visual and auditory and of an unpleasant nature. The delusions, usually unsystematized, tend at first to be depressive and hypochondriacal, revealing a morbid concern about health and an over-attention to bodily sensations and biological functions. Later, and especially in the paranoid type, the delusions become grandiose and persecutory. In general the delusions are unfounded, silly, and transitory.

The appearance of the schizoid undergoes marked changes. He is apt to be negligent in his dress and sloppy in his personal habits. The patient becomes disinterested in his environment, emotionally vacuous, and seems to be without will or feeling. He loses a desire to work, and may wander in and out of jobs, unable to get along with his associates. The schizoid may adopt peculiar mannerisms of behavior and of dress. In general his conduct sets him off from society and accentuates his isolation. Most forms of schizophrenia culminate in a state of apathetic dementia, the prognosis, up to the recent introduction of insulin treatment, being very bad.

The Speech of the Schizophrenic. The peculiar mannerisms which characterize the behavior of the schizoid and which isolate him from society are well brought out in his speech. The auditor seems to be scorned rather than re-

spected. The schizoid arranges, or perhaps disarranges, his words into incomprehensible word salads. Neologisms (invented words with special meanings) add to the auditor's difficulty in comprehension. The schizoid may show perseverating tendencies, automatically repeating words or phrases; regressive tendencies in speech are sometimes revealed by his repetition of words or phrases spoken to him (echolalia). His language forms may become stereotyped. In extreme cases (catatonia) the patient may entirely refuse to speak, thus completely shutting himself off from the help of his fellows. Even when he speaks he is likely to distract and fluster his listeners, very much as Humpty Dumpty, who was so disarranged that "all the king's horses and all the king's men could not put him together again," managed to puzzle Alice in *Through the Looking Glass.*

"You're holding it upside down!" Alice interrupted.

"To be sure I was!" Humpty Dumpty said gayly, as she turned it round for him. "I thought it looked a little queer. As I was saying, that *seems* to be done right – though I haven't time to look it over thoroughly just now – and that shows that there are three hundred and sixty-four days when you might get un-birthday presents."

"Certainly," said Alice.

"And only *one* for birthday presents, you know. There's glory for you!"

"I don't know what you mean by 'glory,'" Alice said.

Humpty Dumpty smiled contemptuously. "Of course you don't – till I tell you. I meant, "There's a nice knock-down argument for you!"

"But 'glory' doesn't mean a 'nice knock-down argument,'" Alice objected.

"When I use a word," Humpty Dumpty said in a rather scornful tone, "it means just what I choose it to mean – neither more nor less."

"The question is," said Alice, "whether you *can* make words mean so many different things."

"The question is," said Humpty Dumpty, "which is to be master – that's all."

Alice was too much puzzled to say anything, so after a minute Humpty Dumpty began again. "They've a temper, some of them – particularly verbs, they're the proudest – adjectives you can do anything with, but not verbs – however. *I* can manage the whole lot of them! Impenetrability! That's what I say!"

"Would you tell me, please," said Alice, "what that means?"

"Now you talk like a reasonable child," said Humpty Dumpty, looking very much pleased. "I meant by 'impenetrability' that we've had enough of that subject, and it would be just as well if you'd mention what you mean to do next, as I suppose you don't mean to stop here all the rest of your life."

"That's a great deal to make one word mean," Alice said, in a thoughtful tone.

"When I make a word do a lot of work like that," said Humpty Dumpty, "I always pay it extra."

"Oh!" said Alice. She was too much puzzled to make any other remark.

If we compare the passage from the imaginatively "cracked" Humpty Dumpty with an actual specimen of the speech of the schizoid we will find in both the unusual use of accepted words and the use of neologisms that embellish the matter of the schizoid's speech, but confound the auditor or reader. The neologisms of the schizophrenic resemble in some respects the character of primitive language. Perceptive details of an object named are more elaborately and more naively stated, as in the phrase "slipping-and-running-away-door" used by the child in the speech specimen below. Schizophrenic language is more concrete than language generally used by normal people. White [9] concludes in this

[9] W. White, "Language of Schizophrenia," *Archives of Neurology and Psychiatry*, XVI (1926), 395.

regard that "The language of schizophrenia is of a lower order of abstraction than normal adult language. . . . The thinking and the speech of a schizophrenic, while of a lower order of abstraction, nevertheless make use of words which we are accustomed to use to express a high order. This discrepancy is one reason why such language is hard for us to understand."

Specimen of Schizoid Speech (Female Child – Age 11):

Q. Tell me a story.

A. Once there was a dog who had a dog bone. It was a big one. The dog liked the bone so he ate it up. He enjoyed it and then he slipped and ran away. Something happened to him. He got a yellow brain body. Then he slipped and ran away. He got sick and then he found himself in a crib and then he slipped and ran away.

Q. To whom did that really happen?

A. To a girl. To me.

Q. Where did you slip?

A. Before the slipping-and-running-away-door.

Q. What is a brain body?

A. A yellow thing with spikes. Runs around like a cow – in body [points to region of lower left rib]. Came to hospital to have it taken out.

We observe in this specimen the repetition of a phrase "slipped and ran away" and the invention of the terms "yellow brain body" and "slipping and running away door." We may note also the preoccupation with bodily organs and bodily functions.

The Aphasic

Pathologists have long been accustomed to consider aphasic speech disturbance entirely from the organic and structural point of view and to treat them as if they were

discretely different from psychogenic disorders such as schizophrenia and manic-depressive psychosis in which speech is altered. This is most unfortunate because it tends to keep in the background much that is vital and important in the understanding and treatment of the aphasic patient. Aphasic speech is related in kind to many other types of speech. It is not entirely unlike the speech of young children; aphasic locutions and neologisms are remarkably like those of the schizophrenics; finally, aphasic speech is very much akin to the slips of the tongue of normal people.

Personality of the Aphasic. When dealing with an aphasic patient suffering from a definite brain lesion we must bear in mind that his speech is not merely the result of the lesion. The aphasic speech is rather a revelation of his new personality, an expression of the sum of his previous experiences which, because of the organic lesion, express themselves in different, fundamentally more primitive ways. Aphasia patients, especially those of the amnesic type who seemingly cannot call up word images, present, according to Goldstein,[10] symptoms which indicate that the patients have lost "categorical" behavior and are reduced to a more concrete level of behavior. The function of naming objects represents something more than a simple superficial connection between a thing and a word. The loss of the meaning of words is accompanied in aphasics by a great change in their world. Their "new language" indicates that the aphasics are building up a world in a particular, concrete way rather than in the more usual abstract way.

The aphasic, like the infant and the stutterer, is a perseverator. A given sound or a word is apt to be repeated

[10] K. Goldstein, "The Problem of the Meaning of Words Based upon Observations of Aphasic Patients," *Journal of Psychology*, II (1937), 301–316.

almost *ad nauseam* as far as the listener is concerned. Whether, as is possibly the case with the stutterer, the perseverating tendency is indicative of lowered vitality or an inability to overcome inertia once a sound has been initiated, is a moot question. Closely allied to the perseverating tendency is the ability of some aphasic patients to imitate words or sounds they hear even though they have no comprehension of the meanings of the imitated words. This echolalic tendency we notice to be present in an early stage of the speech development of the infant. Both the perseverating and echolalic traits of the aphasic indicate a tendency to revert to earlier, more primitive ways of behaving and speaking.

The aphasic further indicates his reversion to more primitive modes of behavior by his heightened emotionality. The aphasic patient is likely to be unstable, he is apt to "fly off the handle" readily and frequently. Amusingly enough, he is usually not impeded in his speech when he is excited; the content of his speech is, however, not articulate and remains on a non-intellectual level, sometimes consisting almost entirely of a stream of swear and "cuss" words. The aphasic's tendency to resort to pantomime and gesture when he wishes to express himself is another indication of a reversion to a more primitive, more concrete mode of behavior. In his thinking, speaking, and general overt behavior, the aphasic reveals to the observer that he is definitely a different and special personality.

The problem of aphasia is probably more complex than any other in speech. To begin with, because the speech characteristics of no two people are alike, there are as many different kinds of aphasias as there are aphasic persons. Aphasic disorders may appear in two people, one suffering from a brain lesion and the other apparently without any

brain injury. The problem is further complicated by the fact that two people may suffer what seem to be identical injuries in a brain area, and only one have an apparent disorder in speech. Without a knowledge of the patient's previous language ability it is not possible to determine to what extent, if any, such ability has been impaired. A person with a broad vocabulary, who has been able to use many different words to express the same idea, may not seem to have his speech impaired after a brain injury because he is still able to express himself. An individual who used one word habitually to express a given idea will more obviously and readily evidence impairment in speech. The form assumed by an aphasic disorder depends not only upon the site and severity of brain injury, but also upon the experiences, habits, education, and intelligence of the patient. In any case, however, aphasic disturbances, strictly from the aspect of speech, are disorders of symbolic formulation and expression, and indicate essentially an inability on the part of the patient to execute readily and easily acts connected with the spoken word, and the comprehension of spoken words. If we confine ourselves to organic aphasia, we may define aphasia as a derangement in the use of language resulting from lesions in the brain cortex.

Historical Résumé of the Studies in Aphasia. The first important modern student of the history of research in aphasia was Broca, who in 1864 demonstrated, after clinical observation, that the speech of right-handed persons is affected by injuries to the superior frontal gyrus (third left convolution) of the brain, while lesions in the right hemisphere did not affect speech. Broca concluded from his evidence that the left brain hemisphere is largely responsible for speech. Following Broca came a series of efforts to localize the brain area for speech. The names of Bastian,

Kussmaul, and Wernicke stand out in attempts to localize the speech area.

Hughlings Jackson, however, was foremost in his opposition to the localization theory. On the basis of observations of aphasic patients, and as a result of post mortem findings, Jackson held that "the more automatic speech processes, including both the inferior types of speech response and the understanding of speech, were more equally and fully represented in each half of the brain than were the higher forms of speech." [11] In other words, there are two types of speech acts, the lower and involuntary ones controlled by *both areas of the brain,* and the higher and voluntary acts, controlled, at least in right-handed people, by the left brain hemisphere and affected by lesions in the left hemisphere. Henry Head, a disciple of Jackson, continued the opposition to the stricter localization theory. It is Head's [12] belief that the capacity to use language in any form is the result of physiological activities of certain parts of the cortex. When these parts are disturbed, no matter the cause, the *result* is a disorder of some degree in the language capacity as a whole, rather than in any isolated manifestations.

Classification of Types of Aphasia. Because there are as many kinds of aphasias as there are aphasic persons, a classification into absolute and discrete types is not possible. Aphasic persons generally suffer from a general disorder in all functions involving the use of language; reading, writing, speaking, and comprehension of spoken language all are likely to be impaired. Usually, however, one of the language functions is more disturbed than the others, and

[11] Quoted in T. Weisenberg and K. E. McBride, *Aphasia* (New York, Commonwealth Fund, 1935), p. 14.

[12] H. Head, *Aphasia and Kindred Disorders of Speech* (Cambridge University Press, 1926), p. 89.

on the basis of the function most impaired, classifications, for the sake of convenience, can be made. We shall adopt the classifications of Weisenberg and McBride,[13] which seem to us to be most useful for clinical purposes.

1. Predominantly Expressive Type. The most serious disturbances are in ability to express ideas in speech or writing. Articulation is defective; word formation and sentence structure are impaired. There is verbal and structural confusion resulting in an erroneous use of words and in ungrammatical forms. The difficulty in evoking words seems to be the same for names, objects, and conditions.

2. Predominantly Receptive Type. Receptive processes suffer more than the expressive. Though the patient can express himself fairly well, he has difficulty in understanding speech sounds or written symbols.

3. Expressive-Receptive Type. All language processes, expressive and receptive, are extremely limited. The patient has considerable difficulty both in expressing himself and in understanding spoken and written symbols.

4. Amnesic Type. The patient's greatest difficulty is in evoking words as names for objects, conditions, qualities, relationships, etc. Emotional and autonomic responses seem undisturbed. Such patients can swear fluently and can count and say words in series without apparent difficulty. The patient can generally recognize the correct word, even though he cannot voluntarily utter it. Speech is hesitant and inadequate and writing is similarly disturbed.

Improvement in Aphasic Disorders. The possibilities for improvement from aphasic disturbances depend primarily upon the extent and degree of the original neurological lesion. Improvement is positively correlated with amelioration of the injured area. Weisenberg and McBride observed

[13] *Op. cit.*

that the expressive type of patient is most likely to improve, while the condition of the expressive-receptive type is most likely to remain static. Though it is possible that if given enough time aphasics will eventually improve as much as they are likely to improve, psychological therapy and re-education are of great value. Psychological therapy attempts to assist the patient in adjusting himself within the limits of his abilities to his abnormal condition and at the same time helps to reveal the extent and limits of the patient's abilities. Re-education attempts to build up new neurograms in uninjured areas which are closely related functionally to the injured or destroyed areas.

All psychotherapeutic and re-educative work must be especially adapted to the individual patient. In order to do this an intensive series of examinations must be made to determine the abilities and disabilities and the adjustment capabilities of the patient. Re-education includes drills in production of speech sounds, letter forms in writing, practice in articulation, sentence structure, etc. The repetition of nonsense syllables is useful as an indication of the patient's ability to articulate sounds. In fact, only nonsense syllable repetition can truly reveal whether the patient has regained voluntary speech. The utterance of a word which the patient had learned in the past may take place on an involuntary level; this is not likely to be the case with nonsense syllables.

Comparison of Infant and Aphasic Speech. The infant and the aphasic patient both represent individuals who are learning to speak. The infant is a novice at the game; the aphasic once played it at great length and with some success, but now only part of the knowledge and skills he learned remain with him. Many of the ideas and motor habits that the infant is acquiring still remain with the aphasic. The

infant's neurons, however, are intact and ready to make connections; no fixed behavior-patterns have as yet been acquired which, in the case of the aphasic must suddenly be altered in order for them to assume patterns once executed by other neurons. Both the infant and the aphasic must learn to use language, but the former has a clean slate and an unimpaired nervous system to work with, while the latter must search for unused space on his slate, and select still healthy neurons to assist him in executing language acts.

The functional conditions of the brain of the new-born child are very similar to those of the aphasic. The new-born child is neither able to produce differentiated sounds nor to react differently to various auditory stimuli. The first cry of the child, we recall, is a variety of the vowel a:, uttered and repeated at great length. The new-born child, though not physiologically deaf because he does react reflexively to sounds of various intensity, is psychologically deaf in that his brain is not able to differentiate the various auditory impressions it receives, or to arrange these impressions according to their source. The aphasic patient of the predominantly receptive type has either lost his capacity for arrangement of sounds or is lacking in simple acoustic comprehension and capacity for differentiation. When the young child begins to react to sounds with a degree of differentiation, such reactions, like the aphasic's, occur at first with only moderate regularity. Gradually in both the infant and the convalescing aphasic, regularity of reaction to acoustic impression takes place.

The development of the spoken word in the child, unless interfered with by injury or ill health, proceeds in progressive steps from the first reflexive, involuntary cry to the first differentiated cry, on through the various stages

until his first sentence word, and then gradually and slowly to the two-, three-, and four-word sentence until he finally acquires a workable vocabulary and a more or less grammatical language. The first word, as we have noted, has a strong emotional import. It is most likely used to express the child's wants about something he can see, smell, or touch. Later the child is interested in expressing himself about what he *does,* and verbs begin to be used, but the verbs are still representative of tangible somethings he can see or feel or smell, somethings he can experience physically and directly. The less tangible connectives, adverbs, articles, and adjectives, are late in being incorporated into the child's speech. The whole developmental sequence progresses smoothly and for the most part proceeds in logical sequence from the simple to the complex. The aphasic, in contrast to the normal infant, if left to his own devices, does not progress smoothly from level to level in his remastery of language. Like the infant, however, his first spontaneous words are likely to have a strong wish-fulfilling content, but they may or may not be nouns. In the case of the aphasic, as with the infant, there is a marked period of delay between the voluntary utterance of the first few words and the acquisition of other words. In general, the aphasic's re-acquisitions appear in random order, depending upon the stimulus-situation which brings them forth. The accent of a word, the inflection of a sound, the intonation of a phrase may recall a word or part of a word to him. There is no ordered progress from sound to syllable to word to sentence. A word may appear by itself, or as part of a phrase, or an entire phrase may appear at once. The word may be a noun, or a verb, an adjective or adverb, or one of the more elusive connecting words. Whatever appears comes at once, and there is no way of predicting what will come. Nor is

there any certainty that, when a word has succeeded in "breaking through," it will remain as part of the aphasic's speech. The word must be *made* part of the patient's vocabulary by repeated use in its proper form. In the case of the infant opportunities for such repetition and practice are afforded by his beaming parents; the child in school is drilled in the use of words; the normal adult supervises his own drilling; but the aphasic, unless he is assisted and re-educated, is left to his own resources. Too often, therefore, he will lose a word even after it has "broken through." It is the task of the re-educator to seize on a word when it is uttered by the aphasic and, through repeated drill, help the aphasic break down synaptic resistance to that particular nerve-impulse, until a neurogram has been established which will make possible and facile the aphasic's voluntary utterance of the word. What neurograms are first established depends entirely upon chance. Indeed, the whole learning process in the aphasic, as with the infant, is a matter of trial-and-success. Both learn to use, pronounce, and understand words in a trial-and-success manner. If a word evokes a response somehow pleasurable for the user, learning is likely to take place. The connection is further strengthened through repetition and continued pleasure in eliciting responses.

The words that remain with the aphasic and the words that break through are likely to be mangled and distorted in pronunciation. Letter sounds or whole syllables may be omitted, some sounds may be transposed, and others strongly influenced by the effects of assimilation. The articulatory errors made by the aphasic closely parallel the errors of the child who is learning to speak. (See pages 138–139.)

In studying the sentence development of the child, we

have seen that the child comprehends and reacts to single words in the sentence rather than to the sentence as a whole. A long sentence containing a word that the child knows may elicit no reaction from him if the sentence veils the known word and makes it difficult for him to recognize it. Most aphasics, like the child, react more readily and more accurately to short sentences than to long ones. Aphasics react well to commands because commands are given in short sentences and the words are clear and emphasized.

The aphasic's speech, like the child's is characterized by a marked inability to produce words voluntarily. Under emotional stress, and in situations which are likely to elicit automatic speech, the aphasic generally has a good-sized vocabulary. Rarely, as we have noted, does the aphasic have difficulty in pouring out a stream of swear words. Voluntary, planned, and accurate speech, however, is difficult, especially for the amnesic type. The young child's speech, like the aphasic's, is produced with great deliberation. He, like the aphasic, has not yet established a *habit of speech,* unless we accept crying as speech. The child will cry in the type of situation in which the aphasic is apt to speak without difficulty. The important difference, in this respect, between the child's speech and the aphasic's speech is that the child possesses intact both the conscious (voluntary) speech process and his habitual, almost autonomic process (crying and babbling). The aphasic has only his habitual, involuntary speech, and that not always intact.

Another similarity between infant and aphasic speech lies in their recourse to gesture, pantomime, intonation, and the use of invented or related words to assist them in expressing their reactions or in communicating experiences for which they lack conventional spoken symbols. The child is more likely to invent a word than the aphasic,

who in place of invention will intone vigorously and repeatedly the few words he hopes express his ideas. The tendency to repeat a word (perseveration) is again comparable to the child's tendency to repeat sounds he has made, observed from the lalling stage through the stage when he reduplicates his first voluntary word sound.

Another point of comparison between infant and aphasic speech is that both pass through an echolalic stage. In the infant we recall, this begins normally after the lalling period and before words are voluntarily uttered, but tends to continue long after the child has acquired his first few words. The aphasic passes through an echolalic stage, but the developmental period, unlike that of the child, cannot be predicted with any certainty. Echolalia is likely to appear most prominently in the aphasic during the period in which few associations between symbol and meaning are formed, and tends to disappear as sounds once meaningless regain their significance, and are repeated for their value as communicative stimuli rather than for their sensory value alone.

SUMMARY

We have discussed the personality and speech of the blind, the stutterer, the aphasic, the manic-depressive, and the schizophrenic because these unusual personalities so vividly illustrate the changes in speech which are brought about by changes in personality or as a result of an initial development of a different personality. We should realize however, that any personality change, and any appreciable deviation from the norm in the mentality of the individual, will be reflected in his speech. To a mild degree such speech disorders may be observed in the normal person when ill, or when tired, or when highly excited. Almost always such

disorders in speech disappear when the individual returns to health, or to a normal emotional state. Psychopathic speech merely indicates what takes place when the abnormal mental state, with the concomitant alterations in personality, is on a more or less permanent basis. The speech of the blind is an illustration of a special type of speech reflecting an unusual and developmentally different personality. The speech of the stutterer is also a manifestation of a special type of personality. The alterations of speech by the different personality types we have considered are abnormal only in that the average individual under ordinary conditions is not likely to indulge in them. But these deviations are entirely consistent with the character of the speakers. Unusual things are said by unusual people *because they are unusual.*

PART V

THE PSYCHOLOGY OF THE AUDIENCE

CHAPTER THIRTEEN

THE SPEAKER-AUDIENCE RELATIONSHIP

The Audience and the Crowd

An audience is a form of collective behavior closely related to a crowd. The audience, according to Young,[1] "is really a form of institutionalized crowd. It has much in common with the crowd, and differs only in the purpose and form of its organization." We will be better able to understand the nature and psychology of the audience if we first study the phenomenon called the crowd.

The Genesis of the Crowd. Whenever several people congregate and react to the same stimulus or situation we have the essential elements of a crowd. If we stop to join a group of people who are standing on a corner gazing at something across the street, we become part of a crowd. A crowd must have some interest in common, some stimulus or situation to which all the members are attending.

Allport emphasizes the emotional element in his definition of a crowd. "A crowd is a collection of individuals who are all attending and reacting to some common object, their reactions being of a simple, prepotent sort and accompanied by strong emotional responses." Allport distinguishes between the crowd and the co-acting group, explaining that in the latter "the attention of each individual is usually concentrated upon his own task, and his responses are non-emotional habits of a rather complex type." He adds, however, that "A co-acting group whose members are attending to a common stimulus may readily be converted

[1] K. Young, *Social Psychology* (F. S. Crofts and Co., 1930), p. 537.

into a crowd." [2] This conversion takes place when there is an emotional reaction to a situation. The phenomenon underlying the conversion is social facilitation, which may be defined as "an increase in response merely from the sight or sound of others making the same movements." [3] In this phenomenon there is a twofold effect of social stimulation: (1) Releasing reactions for which the subject is in readiness and (2) Increasing those reactions once they have been initiated.[4]

Characteristics of Group Activity. A number of experiments have been performed to determine the ways in which groups differ from individual members of the group, and the manner in which the behavior of individuals within a group differs from the behavior of the same individuals without the group. We must remember that in experimental settings situations tend to be simplified in order that they may be controlled. Groups in social life tend to be more complex in their interrelationships than do experimental groups. We must, therefore, proceed with caution in applying experimental findings to normal social groups. The need for exercising caution, however, does not minimize the usefulness and the significance of the experimental findings we are about to present.

1. The individuals in a co-acting group show an increase in speed and production compared with their work when alone. Experiments were performed by Mayer, Schmidt, Neumann, and Allport [5] involving varied tasks, such as mental arithmetic, memory for nonsense syllables, and vowel cancellation. The general findings indicated that most individuals work more quickly in the presence of co-

[2] F. H. Allport, *Social Psychology* (Houghton Mifflin Co., 1924), p. 292.
[3] *Ibid.*, p. 262.
[4] *Ibid.*, p. 261.
[5] *Ibid.*, pp. 262–270.

workers. There was a more pronounced increase in those activities which involved overt, physical movements than in purely mental tasks.

2. The logical value of reasoning suffers when carried out in a group. Allport performed a series of experiments in which nine subjects were asked to write short arguments based on didactic passages of uniform character taken from the writing of two ancient philosophers. The subjects wrote for five-minute periods, alone and in a group. The results revealed that there was an increase in quantity (more statements written) as a result of group work, but that there was a decrease in the value of the arguments. The experimenter concluded that "There is, in short, a kind of wordiness in the reasoning done in the group. . . . The intellectual or implicit responses of thought are hampered rather than facilitated." [6]

3. Individuals in groups avoid extremes, in their judgments. They tend to make their judgments conform to the opinions they think persons about them may have. In a series of experiments performed by Allport, subjects alone and in groups, were asked to express their judgments as to the pleasantness and unpleasantness of odors. The findings indicated that individuals in groups tend to moderate their judgments, avoiding extremes of opinion which they unhesitatingly make when judging alone. Individuals moderate their judgments when in a group because "To think and judge with others is to submit one's self unconsciously to their standards." [7]

The Audience. The audience, we have indicated, is a social phenomenon closely related to the crowd. Usually audiences are more formalized, more institutionalized in

[6] *Ibid.*, p. 274.
[7] *Ibid.*, p. 278.

their organization and behavior than are crowds. Most audiences with which we have to deal as speakers meet in a room having an arrangement of seats which is more or less fixed. As a result of this arrangement the social facilitation resulting from inter-stimulation among the audience is not as great as it is in the crowd. An individual in a crowd is closer to persons about him, so close that he rubs elbows with them and may feel the pressure of their bodies. In a formalized audience situation one may be close to his neighbors about him but not so close as he would be in a crowd. In general the arrangement makes it easier for the individual to attend to the speaker before him rather than to persons on either side of him. For the most part, however, the behavior of crowds is characteristic of the audience as well. An audience differs from a crowd in degree rather than in kind. And frequently powerful speakers are able to make the degree of difference so small as to be of little significance. We shall, in our discussion, refer to an audience as a psychological crowd. We shall be concerned with a particular type of psychological crowd whose members are subjected to the influence of speech.

Polarization (Creating a Psychological Crowd). Before examining the nature of this phenomenon we will spend a moment in observing its genesis. In order to have an audience we must have polarization, the setting opposite of two entities – a performer (speaker) and a listener or group of listeners. But the members of most adult audiences come into a meeting place as individuals. If they remain as individuals there can be no setting opposite of two entities but of many different entities, the speaker and each person in the room. How, then, can the speaker bring about polarization and make a psychological crowd of his audience? The performer can best bring about group reaction by

stimulating the members of the group to react to one another. If the stimulus is of such nature that similarity of response results, success in audience consolidation may be assured. The speaker's task then resolves itself into: "What type of stimuli will bring about homogeneity of response?" Allport [8] comes to our assistance at this point. He says:

> Appeals are made to emotional rather than to thought responses; for emotional expression is the very material of which crowd facilitation is made. A crowd cannot be made up of reasoning individuals, because reasoning involves few outward responses through which individuals stimulate one another. Sentiments common to all are touched upon, since these involve expressive postures of stimulating value. Routine activities such as reading or singing in concert and rising and sitting together are familiar methods of making individuals more aware of one another, and so establishing a receptive attitude toward the expressive stimuli later to be evoked.

There is little we can add to Allport's explanation except to reiterate. An emotional appeal is superior to an intellectual appeal in polarization because emotions involve overt responses and so can be "caught." Few of us are immune to the muscle sets of our neighbors who are responding emotionally. The overt activity in emotional experiences is unconsciously imitated. Thus, when the performer uses an emotional appeal, he accomplishes homogeneity of response by social facilitation. The individuals respond to him and to each other. Because we are more alike emotionally than we are intellectually, the performer expects and achieves similarity of response. The more nearly alike the individuals are as to their wants and interests as determined by their economic, social, religious, and political beliefs, the more

[8] *Ibid.*, p. 300.

readily will they merge into a uniform reaction group. When the speaker succeeds in the setting opposite of two objects – himself and the newly created psychological crowd – he has accomplished polarization.

Is it always necessary for a speaker to polarize his audience and make of it a psychological crowd? The answer depends upon the given situation and purpose of the speaker. If the speaker's fundamental purpose in addressing a group is to impart information or to get the individuals before him to engage in deep thought, the creation of a psychological crowd would be a hindrance. As we have pointed out, logical reasoning suffers when carried on by individuals in a group. Emotional appeals should be avoided if earnest intellectual activity is desired. Should, however, the speaker want the members of his audience to believe as he believes and reason as he reasons, regardless of the value of the reasoning, the creation of a psychological crowd will advance his ends. We shall discuss this matter more completely in a later chapter. (See p. 258.)

The Nature of a Psychological Crowd. Now let us examine the nature of this new audience which we will call a psychological crowd. A complete examination will entail a consideration of a fourfold relationship: (1) The relationship of the whole group to itself – the special responses that the psychological crowd makes because it is a crowd. (2) The relationship of the group to the speaker – the responses made by the group as a whole to one individual who is performing. (3) The relationship of the speaker or performer to the group confronting him and from which he is eliciting responses. (4) The individual relationship of the speaker to each member of the group. All these relationships, of course, exist concurrently, and the effects of the relationships are interdependent. An audience is com-

posed at once of persons who act and react, stimulate and respond as individuals, but who also act and react as a group. The speaker, in turn, stimulates and reacts to individual members of the audience and to the group as a whole. What the persons of the group do as individuals depends upon the immediate and remote experience of each person involved; what they do as a group is determined by their experiences as a group.

Let us consider the first of these relationships. What are the responses of the group as a whole? How is the whole different from any part of the whole? Groups of people react to stimuli according to established social interpretation. Individuals, behaving as such, may react very differently to the same stimuli. The playing of "The Star-Spangled Banner" will make most American audiences rise, but the British "God Save the King" (the music of which is familiar to us as "America") will not move the same audience from its seats, though the members of an English audience will rise as one. The rising audience is reacting to a social stimulus. The members of this audience as individuals listening to the same music in the privacy of their homes, will not, with the possible exception of the Milquetoasts, trouble to rise while the national anthem is being played. Social custom has resulted in the establishment of a pattern of reaction on the level of habit. In this instance it is exhibited in rising to the playing of a particular musical composition. Audiences as groups tend to yield to environmental pressures exerted in the forms of customs, beliefs, or conventions and respond with established pattern reactions. Responses are made with little deliberation, without self-criticism, and without delay. There is no question as to the unconventionality of an act performed, because all are performing it. That act which when performed by any one

person might be radical, becomes conservative when performed by the group, because then there is no departure from convention. The convention is being established by mass action in the very act of performance. So, men with poor voices who never dare to sing alone, unless *entirely* alone, do not hesitate to sing in chorus. There is little need for initiative, inhibitions are released, and mental effort is low. Men who meet together are generally ready to yield to direction. They come to be harangued, inspired, or amused. They have a characteristic mental inertia which makes them receptive to directed stimulation.

This brings us to a consideration of the second type of relationship – that of the group to the speaker. What characterizes the responses of the group as a whole to one individual? The mental inertia of a group, its readiness to yield and its normal dislike to oppose enables the performing speaker to control and direct the mental processes of the polarized group. While reaction continues on the crowd level, the speaker can do with his group much that he could not do were he talking to any isolated individual of the group. It is not too far-fetched to compare the completely polarized crowd with that of the hypnotized subject. Just as the operator can control the thought, emotions, and action of the hypnotized subject by suggestions that are within the normal limits of the subject's activities and consistent with his moral life, so the speaker before a crowd can control and direct its activities. Once the operator attempts to exceed the normal limits of his subjects by suggestions that are contrary to the subject's innate tendencies, the hypnotic state is broken. So also polarization will come to an end when the performer attempts to direct a crowd in ways opposed to or inconsistent with its established habits, and attitudes.

The third relationship, that of the speaker to the group confronting him and from which he is eliciting responses, has already been implied. It is often the speaker's task to transform his audience into a psychological crowd. Having once accomplished this through polarization, it is then the speaker's continued task to maintain his audience as a crowd. This he must accomplish by making himself a more potent source of stimulation than any other which may emanate from the objects in his environment. The "operator" before the "hypnotized" audience must assist it in being relieved of its inhibitions. But only those inhibitions which in a given situation may be discarded with respect and dignity. Some of the social proprieties which individuals of the audience have may be ignored, but the proprieties of the group must remain intact. To break them would end the "hypnotic spell," polarization would cease, and group direction would become impossible.

A fourth relationship, that which exists between the speaker and each member of the group, will now be considered. The speaker before an audience very rarely wants to direct its activities as a group. More usually the performer wishes to get the members of his audience to act as individuals, even though he is interested in similar action from as many members of the audience as possible. When a speaker affects an audience he affects individual members of an audience. The one-to-one reaction is present before the one-to-many (speaker-group) reaction can begin to take place. The speaker influences the group by stimulating individuals in a group who in turn stimulate one another. This inter-group stimulation influences the further reactions of members of the group to the speaker. Polarization is accomplished by the speaker's affecting individuals in the audience. The end result of polarization, the psychological

crowd, in turn influences the responses of the constituents of a crowd to the speaker. The so-called "group mind" is only slightly different from the mind of any one individual who is a member of the group. The group mind takes its character from the individual mind. It exists only at the pleasure of the individual mind, which always reserves its prerogative of separating from the group. The hypnotic state is never so complete that it cannot be terminated. It ceases very abruptly if what is taking place during hypnosis is inimical to the ultimate best interests of the subject. If nothing occurs to cause a sudden termination of the hypnotic state, the effects of the trance wear off in a short time. Even Svengali had to rehypnotize his Trilby, and Svengali's powers were great indeed, for they were given him by his author!

Types of Audiences

In all audience-speaker situations the speaker's function is to cause responses in the audience. In many, perhaps in most, audience-speaker situations, the speaker is trying to influence the audience in some definite way. The success or failure of the speaker in his ability to influence his audience depends upon what responses the speaker causes to take place. A successful performance requires that the speaker have ability in arousing and directing only those responses which are useful for his purpose. The technique of influencing an audience is divided by Hollingworth [9] into five steps: (1) Securing attention, (2) Establishing interest, (3) Making an impression, (4) Convincing the audience, and (5) Directing the audience.

[9] H. L. Hollingworth, *The Psychology of the Audience* (American Book Co., 1935), p. 18. (Passages from this work are copyrighted and are here used by permission of the American Book Co., publishers.)

Not in every audience, however, does the speaker have to go through all five steps. Frequently part of the job may be done for him before he meets the audience. The amount of the task that remains to be done and the amount already accomplished depend in large part upon the type of audience and the audience situation with which the speaker is concerned. Occasionally it may be the speaker's task to perform one or two of the tasks, such as securing attention and holding the interest of the audience, preparing it for another speaker who is to complete the remaining tasks. Political speakers often resort to this procedure.

There are as many types of audiences as there are audience situations. No two audience situations are alike, and at no given moment will one find two audiences alike. The time, the occasion, the atmospheric conditions, the physical environment, etc., as well as the speaker, affect the speaker-audience situation, and so the audience. But we may, unless we are hairsplitters, follow Hollingworth [10] in dividing audiences into five general types according to the degree of integration.

1. *The Casual Audience.* The first type we will consider is the audience composed of casual and unstudied aggregates. A railway station or subway crowd waiting for a train to pull in are examples of this type of audience. The speaker who has to deal with this audience type has to go through all five steps for a successful performance. He must begin by orienting the individuals toward himself; he must first win their attention before he can proceed with his other tasks and attain his final end – that of directing the members of his audience to do as he wishes.

2. *The Partly Oriented Audience.* The second type of audience is typified by the discussion group. The discussion

[10] *Ibid.*, pp. 21–25.

group generally meets indoors, in a room designed for meetings and discussions. If the group meets in an auditorium the general layout or plan of the room, the position of the speaker's platform, and the arrangement of seats for the audience, make for orientation toward the leader of the discussion. In a small discussion group each member may at some time become the speaker, and so attention shifts from one person to another. The members of the group, however, are aware of the nature of the speech situation, and so are prepared for shifting their attention. The members of a discussion group, unless they have established reputations as poor speakers, do not have to face the initial task of securing the attention of their audience. The first real task for the discussion-group speaker is to establish audience interest.

3. *The Selected Audience.* The selected audience is one assembled for some common purpose or goal. The members may or may not be sympathetic with one another or with the speaker's point of view. A meeting of a professional society or a legislative assembly are examples of this type of audience. The nature of the audience situation should make it unnecessary for the speaker to try for attention or to strive to gain interest. The speaker has the remaining three of the five tasks to perform in regard to his audience, namely: to impress, to persuade or convince, and to direct.

4. *The Concerted Audience.* The fourth general type of audience is the rather highly integrated, concerted audience. The members of this type of audience assemble because they have a concerted active purpose, and a mutual and sympathetic interest in an enterprise. A class in school, such as a college class in political science, engaged in discussing a specific problem in politics or economics, is representative of the concerted audience. The speaker in

such a group has to convince and to direct action. He has the right to expect, unless he is a particularly poor speaker, that attention, interest, and the making of an impression are inherent in the speech situation. It is often unfortunate but true that in college classes the audience assumes the burden of the third task, securing an impression, because the speaker feels that he need make no special efforts along that line. If the college professor does not make an impression upon his audience (the class) the members of such an audience are in danger of failing a future quiz. To assist themselves in fixing impressions, students resort to devices such as the taking of notes.

5. *The Organized Audience.* The organized audience is the most highly integrated. Any group so organized that there is strict discipline and a delegation of authority and a division of labor, where mutual interest and common purpose are taken for granted, may be considered an organized audience. A military unit, a football team, are examples of such groups. The captain of a football team has but to direct his team in action. Ordinarily, there is no need for him to convince his team-mates that they ought to win, or ought to be interested in what he has to say; nor need he strive to interest or impress his team.

The following table, adapted from Hollingworth,[11] will serve to sum up what we have said about the five types of audiences. The possible tasks confronting the speaker with each type of audience are indicated.

Determining the Speaker Tasks in an Audience Situation. Every performer facing an audience must decide exactly how many of the tasks he wishes to complete. He must be able to determine at which stage his audience is and how far to carry his audience before he takes leave of it. Fre-

[11] *Ibid.*, p. 25.

TYPES OF AUDIENCES AND SPEAKER TASKS

Type of Audience	Casual (Street Corner Crowd)	Partly Oriented (Discussion Group)	Selected (Legislative Assembly)	Concerted (College Class)	Organized (Football Team)
Speaker Tasks	Attention Interest Impression Conviction Direction	Interest Impression Conviction Direction	Impression Conviction Direction	Conviction Direction	Direction

quently it is unwise to complete all the the tasks at one performance. It is often better to gain attention and interest at one performance, and leave the making of an impression for a succeeding performance. This is a frequently used radio technique. The manufacturer of a soap will announce a contest of interest to all listeners at one broadcast. Nothing may be said about the specific virtue of the soap until the following broadcast. Perhaps not until the third broadcast in the series are the listeners told how much better soap A is than all other soaps on the market, and that a special introductory offer of the soap is to be made the following week.

Every audience presents problems that the speaker must analyze. The preparation of the audience, the nature of the occasion, as well as the purpose and abilities of the speaker, will help him to determine what his specific tasks are, where to begin, and how far to proceed. Sometimes the speaker will err in his judgment. He may assume that an audience has been prepared for his address and discover, to his chagrin, that it does not expect his type of address at all. To attempt to present it is to court disaster. A speaker in such a predicament must be ready to change tactics, to give his audience the preliminary preparation he thought it already had.

Sometimes, of course, he may find his audience unexpectedly thoroughly prepared for his talk. To take time for preliminary preparation is more than wasteful. The performer may antagonize his audience by telling it many things which its members already know. But more than that, the performer is wasting the opening minutes of his speech, the minutes when he has optimum attention with minimum of effort. The successful speaker must be ready to abandon his prepared talk if the situation demands it. One college dean made himself beloved by generations of students by doing just that. The occasion took place during Freshman Orientation Week at a leading eastern university. The incoming freshmen had assembled in the college chapel to be addressed by several speakers before going to a buffet lunch tendered them by the Alumni Association of the University. The morning wore on, with each speaker taking a few minutes longer than his scheduled time, and yet the dean had not spoken. Finally, and it was long past lunch time, the dean came to the platform. "Gentlemen," he said, "I have a most important message for you. Lunch will be served immediately." These words spoken, his speech was done, and he left the platform.

CHAPTER FOURTEEN

ATTENTION

The Nature of Attention

Changing Concepts in the Study of Attention. A review of the changing concepts of attention is in effect a review of the science of psychology with its beginnings in philosophy and its present extensive ramifications in physiology. When psychology was defined as the study of consciousness, the paramount problem was to determine the source of ideas. The European school held that ideas were innate in the individual. John Locke believed that ideas originated from sense impressions upon the receptive mind – a *tabula rasa* – whose function it was to receive impressions from without. The notion of the innateness of ideas, with its inherent supposition of the existence of a subconscious mind, constitutes the first step in the history of psychology of attention.[1] A later development of this theory introduced the notion that when the senses were stimulated, sense impressions developed to the *conscious* level if the proper articulation existed between the sense impressions and the subconscious mind. The subconscious mind now was called the *apperceptive mass,* and articulation was considered an assimilation of new experiences into old experiences. Herbart (1776–1841) used the term *apperception* to mean an interpretation of new impressions by means of the existing body of old sense impressions – the apperceptive mass. Thus, there were two levels of the mind – the subconscious or apperceptive mass, and the conscious or sense impressions.

[1] R. H. Wheeler, *Science of Psychology* (T. Y. Crowell Co., 1930), pp. 343–346.

Wundt brought us closer to modern psychology. He modified the two-level notion of the subconscious and the conscious minds and substituted the theory of a single conscious level having a focus and a margin. Wundt preferred to speak of the *levels of attention* rather than of levels of consciousness.

Titchener (d. 1927), who was much influenced by Wundt and the British associationists, further modified the traditional notion of levels of consciousness. Titchener construed them as levels of clearness. Attention, according to Titchener, was not a function but a definite form of awareness, namely, sensory clearness.

Pillsbury [2] brings us up to contemporary thought in regard to the psychology of attention. The essence of attention as a conscious process is an increase in the clearness of one idea or group of ideas at the expense of others. Pillsbury pointed out the close relationship between attention and bodily movement. He, in common with most present-day psychologists, believes that every act of attention is accompanied by some bodily movement. The ultimate result of the bodily movement is integrative action. O'Neill and Weaver sum up contemporary thought in regard to attention in their definition of attention as: "A unified, coordinated muscular set, or attitude, which brings sense organs to bear with maximum effectiveness upon a source of stimulation and thus contributes to alertness and readiness of response." [3] Before we proceed further with our study of attention, we will pause to consider the role of bodily action in the phenomenon of attention.

[2] W. B. Pillsbury, *Attention* (The Macmillan Co., 1908), p. 11.

[3] J. M. O'Neill and A. T. Weaver, *The Elements of Speech* (Longmans, Green and Co., rev. ed., 1933), p. 249.

Bodily Action in Attention

General Attention Attitude. Five athletes are gathered about a white line on a running track. One is stretching his legs; another runs five or six yards from his starting place, returns, and runs off again; two are engaged in conversation; the fifth stands alone, looking rather nervous. A sixth man, much older, and not attired for running, approaches them. When he comes to the white line he pauses for a moment and then shouts, "On your mark." All five athletes now drop to one knee, the left foot of each is on the white line, the right foot about a half yard behind the left. "Get set," commands the starter, and the runners are "set": their tense backs are now parallel to the running track, their necks rigidly holding their heads high. A gun cracks, and the runners are off on their race. What was the purpose of the commands "On your mark" and "Get set"? What happened to the athletes that caused them to change their individual activities and concentrate their energies on the same activity? The commands aroused a "set" that assisted the runners in shutting out stimuli of a varied nature and in eliminating miscellaneous responses so that they were enabled to attend and respond to the one stimulus that took precedence over all others, the pistol shot.

Two types of bodily responses occurred in the act just described: first, there was a general attentive attitude, and second, a special adjustment of the organs of the body for the anticipated response. Because we are primarily interested in what happens to a group of people under the influence of speech, we will examine an audience listening to a speaker in order to observe its general attentive attitude and its special adjustments. Most members of the audience, we notice, have a fixed gaze with the speaker the object of

their fixation. Some members of the audience are actually leaning forward, trying to get as close to the speaker as the physical situation permits. There is a minimum of restless movement; breathing is quiet and regular. The general attentive attitude is characterized by immobility, with the body directed or set for the object commanding attention – the speaker.

The immobility of readiness is only part of the bodily responses in attention. This preliminary "set" prepares the body for the next part of the performance. The organs of the body are now ready to receive and respond to the stimuli to be presented by the performer. The sensations which the auditor is about to experience will, because of the attentive attitude, be clearer and stronger. But the responses of the listener will now be mobile and transitory. Attention, which started by being fixed, has now become exploratory. Woodworth, in speaking of the second phase of attention, says:

> The exploratory character of attention shows itself in *sense organ adjustments* which enable the individual to get stronger and clearer sensations from the object that has aroused attention. Attention to an object in the hand is shown by feeling of it, to something in the mouth by tasting movements, to an odor by sniffling movements, to a sound by a horse's pricking up his ears or by a man's cocking his head and turning his eyes towards the source of the sound. The eye movements in attention are elaborate and instructive. The eye is focused on the object by the action of the ciliary muscle adjusting the lens to the distance of the object and the two eyes are converged upon the object, so that light from it strikes both eyes at the fovea or center of clear vision. If the object is in motion, the eyes fixate by the pursuit movement, and if it is still, they jump to it and fixate it by stopping on it.[4]

[4] R. S. Woodworth, *Psychology*, pp. 366–367.

Selectivity of Attention. Attention then, is mobile and exploratory. When a complex of stimuli is presented consisting, let us say, of lights, sounds, and smells, and objects to be touched, attention shifts from one part of the total complexity constituting the situation to another. Now a certain smell stands out in bold relief; now a sound of a given pitch wins pre-eminence; perhaps soon a light will be the most vivid of the images.

Up to this point we have been considering attention as primarily a motor process. But attention is more than a motor set, or we would not be able to shift attention *without a change in motor set.* When we look at a flower we may first attend to its color, then to its shape, and then to its odor without experiencing any change in bodily position. We may attend to a noise without turning to the source of the noise, or to a light without looking at the source of light.

The Nature of the Stimulus in Attention

From our experience we know that though it is possible for us to attend to almost any stimulus, certain types of stimuli are more likely to attract our attention than others. Some objects by nature are more effective and have an advantage over others in "clearing the deck" and gaining access to our consciousness. It is important for us to know something about these more effective stimuli. Woodworth [5] explains the effectiveness of certain stimuli on the basis of *factors of advantage.* We will consider these factors or natural attention values, none of which are learned.

1. *Change.* Change or variety is probably the most fundamental and most important attention value. To maintain attention we must have diversification of stimuli. A pro-

[5] *Op. cit.,* chap. IX.

longed sound of a given pitch or intensity will not long be attended to. When a stimulus or a configuration has called forth complete responses in an organism, it ceases to function as a stimulus. The sound must be changed in one of its aspects to command continued attention. A decrease or an increase in intensity, a change in pitch or in quality will cause us to continue attending to the sound. In reading printed material we do not fixate our attention on any one word for a long period of time. Reading, of course, takes place during the intervals when attention is being shifted from one group of words (eye span) to another. But suppose we wish to pause upon one word. We will then find that we are attending to the length of the word, the shapes of the different letters, the thickness of the print, etc. When the stimulus or configuration does not present change we seek to provide it ourselves.

Movement is an attribute of change. Diversification of change of movement makes for prolongation of attention more than rhythmic movement. When objects move according to a rhythm or in a given pattern, some of the attention value is lost because of the *lack of variety*. Moving objects will be most potent in maintaining attention when the observer cannot predict the extent and direction of the movement. The moving object must always, of course, be kept within the limits of the visual field of attention.

2. *Intensity*. The intensity or strength of stimulus is the second of the attention values to be considered. In general, a strong stimulus will attract attention before a weak one, or force its way into consciousness when competing with a weak one. When all sounds assailing an auditor are of moderate intensity, a loud sound is more likely to attract attention than a feeble one. However, should all the sounds

be of great intensity, a feeble sound, if discernible, will then attract attention. Not mere intensity, but *change in intensity* is important. In regard to visible objects, size has an effect equivalent to intensity. Other things being equal, a large object is more likely to attract attention than a small one. In the case of light, the more brilliant a light the more potent it generally is in winning attention. Positive intensity or strength of stimulus, then, is important as a factor of advantage in attention when it does not compete with change or variety. Negative or decreased strength of intensity when it constitutes change will be more potent than positive intensity which does not constitute change, as an attention value. In brief, *change of intensity* is more important in attention than intensity *per se*.

3. *Repetition*. Repetition is the third attention value. The effect of repetition is to increase the strength or intensity of the stimulus. A repeated outcry of "Help!" "Help!" "Help!" may attract attention and succeed in bringing assistance when one "Help!" would not. Once again, the repeated stimuli must not be presented so often as to lose their variety and become monotonous. As soon as monotony sets in, a more novel stimulus will force its way into attention.

4. *Striking Quality*. Striking quality is the fourth attention value. Usually this factor is accompanied by increased intensity, though this is not necessarily so. Though we tend to yell more intensely when we yell in a high-pitched voice, the high pitch is in itself a potent factor in attracting attention. It would remain potent even should the intensity of the sound be diminished. A pinch in which only a small area of skin is involved is generally more striking than an equally intensive pinch involving a larger skin surface; a sudden tap on a localized skin area is correspondingly more

striking than a smooth touch equal in pressure over a larger skin area. Woodworth sums up the matter by saying:

> Saturated colors, though having less intensity of light than pale colors, are stronger stimuli for attention. High notes are more arresting than low. Itch, tickle, and pain get attention in preference to a broad smooth touch. What shall be striking depends upon the organism and cannot be defined in purely physical terms.[6]

5. *Definiteness of Form.* The last of the natural attention values is definiteness of form. The more definite, the more sharply defined the object, the more likely it is to attract attention. A small, definitely shaped cloud is more attractive than a wide expanse of cloud without sharpness of outline. The arrangement of heavenly bodies into forms give us such constellations as the Big and Little Dippers, and Orion. These arrangements are attractive and win our attention when we gaze at the sky. The moon, having greater definiteness of shape, easily attracts our attention whenever it can be observed. Sounds assume definiteness of form when they are arranged into patterns which we call music. The simple tune or jingle represents an elementary type of well-defined sound. The motif of a symphony stands out, wins our attention, and is remembered.

Learned Factors of Attention. The five attention values which we have discussed are all unlearned. They are natural factors of advantages which do not depend upon the experiences of the individual in winning access to his consciousness. There are, however, other attention values which depend upon the experience of the individual for their effectiveness. These we may call learned factors of advantage. The entire past history, remote and immediate, of any in-

[6] *Op. cit.*, p. 370.

dividual enters into making up his wants, interests, and attitudes, and serves to determine how a stimulus or a complex of stimuli will be received. The wants, interests, and attitudes of a person determine what he will learn, and in part the length of time to be taken in the learning process. Because of this, some natural attention values may go by the board for certain individuals. Stimuli which are in keeping with the person's interests, which help to satisfy his wants, which are in accord with his learned attitudes, will attract and hold his attention. The automobile racer pays no attention to the loud roaring of the motor, an intense sound having a natural attention value, but will become alert to any low sound that may indicate that his motor is not functioning properly. The sleeping mother may not be awakened by the sirens of fire engines outside of her home, but the slightest outcry of the baby will waken her with a start. The ringing of a telephone during the night will waken a sleeping physician or nurse, though the sleep of other members of a household may continue undisturbed. The engaged girl or boy may be attracted to the rings in the display of a jewelry store, though the much larger watches, bracelets, and brooches may go unnoticed. The same individuals, on their first wedding anniversary, may allow the rings to go completely unnoticed, but be immediately attracted to the watches, bracelets, and brooches. What will be noticed in any display depends predominantly upon what the individual is looking for, as determined by his interests, and secondarily, upon the relative prominence of the articles as arranged in the display. The wants, interests, and attitudes, remote and immediate, motivate attention, serving to make it easier for certain types of stimuli to win their way into the individual's consciousness, and making it well nigh impossible for other stimuli to gain access.

Passive and Active Attention

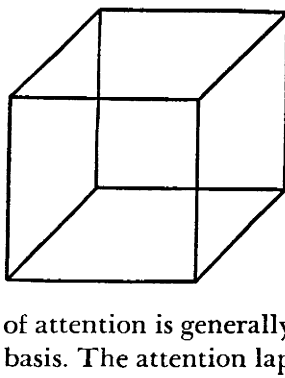
Passive Attention. We attend to stimuli and situations either because we find ourselves by the nature of the experience unable to do otherwise, or because some pressure exists which compels us to attend even though we might prefer not to do so. Whenever we attend without a division of will – when we cannot for a moment wish to do otherwise – we are paying passive attention. Such attention is effortless. It is the attention we give to a loud noise – a crash or a shriek; it is the kind of attention we give when our wants, our interests, and our attitudes are closely related to the situation at hand. Passive attention is involuntary.

Active Attention. When, however, we force ourselves to attend to a situation, as the unhappy college student must do before examination time, we are paying active or voluntary attention. Such attention is accompanied by effort, frequently by resentment, and may result in the rapid onset of fatigue. The onset of fatigue makes the continuation of attention all the more difficult because an increase in effort is required to overcome the effects of fatigue.

Can active attention become passive? The answer depends on how the situation succeeding the one to which voluntary attention is given, develops. If, in the subsequent situations, the natural attention values are present; if there are enfolded factors which are related to the individual's needs and wants, his likes and interests, voluntary, active, effortful attention is likely to become involuntary, passive, and effortless. An individual who may have begun by attending to a situation because he was for some reason forced to attend, may later attend to the situation because he cannot help himself, because it may now require an effort of will not to attend.

Duration of Attention

It is important to know the length of time and the number of objects than can be attended to simultaneously. The average duration of attention is a factor varying with both the individual and the situation. According to Pillsbury,[7] the duration of a single act of attention is from three to twenty-four seconds, most usually five to eight seconds. Billings,[8] as a result of intensive experimentation, concluded that the average duration of attention is in the neighborhood of two seconds. A simple experiment to measure the duration of attention can be performed by any interested person. Let us take the classic ambiguous cube figure:



The individual observing this figure will first perceive one grouping or arrangement of lines. Then, and without any warning, another arrangement of lines, a new pattern, will be perceived. The time elapsing between the "shifting of the lines" resulting in new patterns is the measure of the duration of attention. The lapse of attention is generally explained on a neuro-physiological basis. The attention lapse permits the organism to rest, and serves to relieve the tensions caused by sustained attention. Were there no lapse, mental and physical enervation would result, making prolonged concentration impossible. The very fact that attention does not persist but fluctuates makes sustained concentration possible.

Attention and Perception. To how many objects can we

[7] *Op. cit.*

[8] M. Billings, "Duration of Attention," *Psychological Review,* XXI (1914), 121–135.

attend at one time? In this question we are using the term "attend" in a somewhat specialized sense. If we were strict academicians, we would be careful to use "perceive" or "apprehend" rather than "attend," and to reword our opening statement to read "How many objects can we perceive at one time?" What is the relationship between attention and perception or apprehension?

Attention, we recall, is a preparatory process. It helps us to get ready, to "get set" for what is to be presented. What takes place when we react to the presented stimuli is perception or apprehension. Attention prepares us to observe what is about to take place, and to know what is taking place. Attention and perception are inseparable. The laws for the former govern the latter. What we perceive is determined by our habits of attention. Attention, we know, is partly dependent upon learned and partly on unlearned factors. Perception is quite sensitive to and readily susceptible to the influences of learning. The natural attention values which we have discussed also pertain to perception. Our wants, interests, and attitudes – learned factors influencing attention – extend their influence to perception as well.

Because attention and perception or apprehension are inseparable, in the ensuing discussion, we shall take the liberty of using the terms synonymously. Now, let us go back to our original question: "To how many objects can we attend at one time?" What we are really asking is, "What is our span of perception?"

Attention Span. The simple and now classical experiment of marbles in a box will answer the question in regard to the number of objects to which we can attend at once. A few marbles are placed in a box. The open box is presented to us for a quick look. We are to *tell,* not to guess, how many

marbles are in the box. Accurate measurement will seldom exceed five marbles, more frequently it will be but four. The attention span, for this situation, is four or five objects (marbles). Now let us present a slightly more complicated experiment using apparatus found in a psychological laboratory. Let us suppose that a series of cards with dots is exposed to us, each through a tachistoscope, for a fraction of a second. How many dots will we be able to perceive accurately? We will find that the answer varies from individual to individual, and with each individual from time to time. Almost all of us will have no difficulty with cards containing two, three, and four dots. Some of us will make mistakes when five dots are presented; more of us will make mistakes with six dots; many of us will be in error when seven dots are exposed. As the number of dots is increased, accurate perception is decreased and guessing begins. But why are so many of us able to perceive as many as eight dots when there is no time for counting them? The answer is that we see things in groups. Three or four dots, in a close spatial arrangement, appear to us as one group. With a varying arrangement we may see more than one group, as in the figures below. If the

o o o o	o o o o
a single group	*two groups*

arrangement is such that grouping is difficult, perception of the number is difficult.

The type of material presented is important in determining the number of objects to which we can attend. Familiar words can be read two or three at a glance, a whole phrase containing four or five words can be read in one eye sweep if the words of the phrase are familiar. The accomplished musician may be able to attend to three or four notes at

once; the beginner has all he can do with one. In general, though the attention span varies with the individual and the situation, we can attend to four or five objects visually and from five to eight auditorily.

Clearness and Attention Span. What happens to the individual as his attention span increases? Assuming that one is capable of attending to a maximum of eight objects presented to vision, is it advisable always to present the maximum number? Chapman and Brown,[9] using tachistoscopic material, found that there was an increase in clearness when there was a restriction in the range of attention. In general, experimental evidence shows that when attention is distributed over wide fields, sharpness of differentiation tends to decline toward the periphery. The observer is still aware of stimuli on the borders, but the stimuli seems somewhat hazy and lack clarity and definiteness. From the point of view of the presenter of the stimuli, it is uneconomical to tax the observer to the extent of his entire attention span. It is better to have attention focused at one point, so that differentiation of stimuli may be sharp and clear.

Summary in the Study of Attention. Attention is an expression of the functional unity of the co-ordination of behavior. The attending organism experiences two kinds of bodily activity: (1) A general attentive attitude and (2) A special adjustment of the organs of the body which enables the organism to make a quick response in a specific situation. The situation to which the organism is adjusted becomes, for it, more highly significant than any other at the moment.

Attention is mobile and exploratory. It shifts from one part of a situation to another.

[9] D. W. Chapman and H. E. Brown, "The Reciprocity between Clearness and Range of Attention," *Journal of General Psychology*, XIII (1935), 357–366.

There are natural or unlearned attention values and also learned factors of attention. The natural attention values are: (1) Change or variety, (2) Intensity or strength of stimulus, (3) Repetition, (4) Striking quality, and (5) Definiteness of form. The learned factors of attention are those which are determined by the past experiences of the reacting organism. To a large extent the wants, interests, and attitudes of the individual control the attractiveness of a stimulus or a situation.

The attention (perception) span is a variable factor, depending upon the nature of the individual and the nature of a situation. In general, the number of separate objects that can be attended to is four or five for vision and five to eight for audition. The duration of a single act of attention is highly variable, ranging from three to twenty-four seconds, but more usually restricted to from five to eight seconds. An increase in the range of attention results in a decrease in the clearness of the stimuli on the fringes of the range. As the range is decreased there is an increase in clearness of stimuli within it.

Attention in the Speaker-Audience Relationship

Securing Audience Attention. The first of the problems to confront a speaker in an audience situation is that of winning the audience's attention. A speaker confronting an audience is competing with many stimuli. He competes with auditory stimuli in the form of sounds produced by members of the audience. He competes with the visual stimuli presented by the audience members themselves as well as the visual stimuli from their physical surroundings (the walls, pictures, ceilings, lights, etc.). He competes with olfactory stimuli presented by the people and the meeting place,

etc. Before a speaker can proceed with his other tasks and progress toward accomplishing his speech purpose, he must overcome the effects of all these competing stimuli and become the main source of stimulation; his audience must respond and attend to him, he must win attention to himself and away from competing sources of stimulation.

How can a speaker succeed in his task of "winning a clear right of way" to the minds of the members of the audience facing him? We have said that change or variety is the most fundamental of the attention values. The speaker must supply his audience with changes in stimuli. The speaker facing a gathering engaged in conversation will waste his efforts if he seeks to attract attention through vocal speech, unless the sounds he attempts to produce are different from the sounds of the audience. His voice may be made to vary in pitch, intensity, or quality. But shouting above the noise of the gathering is both difficult and undignified. The speaker's pitch range is probably limited to the pitch range of the group engaged in conversation, and the chances are that the quality of his voice is similarly limited. What, then, can the speaker do to attract attention to himself? The wise speaker will determine what sensory avenue of the audience is at the moment unoccupied, and make his way through that avenue. If the audience is engaged in conversation, the visual avenue is relatively unoccupied. The performer should use that. The lifting of his hand will generally be sufficient to stop conversation and attract attention. The speaker, by this gesture, will become an effective source of stimulation toward which the sense organs of the members of the audience will be directed. He has thus helped create in his audience the proper set or attitude so that thereafter whatever stimuli he presents will be reacted to with alertness and readiness.

Maintaining Audience Attention. Having attracted attention, it is now the speaker's task to maintain it on a passive level. Attention, we remember, is fluctuating. We cannot attend to the same stimulus for any length of time. The speaker desiring to maintain audience attention must bear this in mind and be ever ready to make use of his knowledge of the fundamental attention values. First, he must be prepared to present a variety of stimuli. The stimuli, though varied, should be organized; they should seem to emanate from the same source and work toward one end. The public speaker may accomplish this by employing changes in the attributes of sound – pitch, time, quality, and intensity. A decrease or increase in intensity, a change of pitch, the use of a different voice quality, will make it easier for the speaker's audience to continue to attend. In general, the more extreme the changes the greater will be the effect. The degree of change should therefore be determined by the effect the speaker wishes to produce.

The speaker will assist his audience in attending to him if he moves before it. Movements for their own sake, however, are generally not desirable. They should be made meaningful. The extent and direction of movement, as with all bodily action, should be of help in conveying the speaker's *change in thought.* The speaker, unlike the writer, cannot utilize such visual aids as page margins or punctuation symbols to indicate a change in thought to his audience. Fortunately, bodily movements, to a large extent can be made to serve the same function. The shifting of the weight of the body from one foot to another, in addition to relieving the tension in the speaker and so empathetically in the observers, may very well indicate a slight change in thought, a "new paragraph." A step or two may announce a greater change in thought, a "new chapter." Movement

so executed does more than help maintain attention; it directs the audience mind and prepares it for new ideas.

Change in Intensity. Change in the intensity of the stimulus is the second of the natural attention values at the speaker's disposal in his task of maintaining audience attention. The speaker can change the intensity of his voice or of his actions. The change in degree of intensity should be determined by the nature of the preceding stimuli. When the sounds used by the speaker up to the moment of the change have been of moderate intensity, an increase in loudness is desirable to maintain attention; after a series of loud sounds, a sound of moderate or low intensity is more likely to attract attention. So also with bodily actions. They should be vigorous if preceding movements have been moderate in intensity; they had better be moderate or mild if up to that moment the speaker has been employing vigorous activity. Always, of course, the import of what is being said by the speaker should be a dominant factor in determining the nature of the movements.

Repetition. Repetition, if it does not result in monotony, is the third natural attention value available for the speaker's use. Though the single utterance of a word or phrase may fail to attract attention, the reiteration of the word or phrase may succeed. The repetition of a word with an increase in intensity on each repetition is a device many speakers employ both for attracting attention and for gaining emphasis.

Striking Quality. Striking quality is the fourth attention value at the speaker's disposal. This value is seldom used by itself. More usually, though not at all necessarily, striking quality accompanies a change in intensity. A high pitch is all too likely to be associated with an increase in the loudness of the voice, even though the high pitch is

sufficient in itself to attract attention. The combination of high pitch and loudness results in noise. Though noise may help to maintain attention by preventing lethargy, its use has many possible dangers. The audience may resent the noisy speaker because he seems to be "yelling" at them; or perhaps, even worse, the audience may learn after a very short while that lethargy is more pleasurable than strain. The voice if it is high pitched or intense must still not sound "scoldy." If it is loud, it must convey something in keeping with its loudness.

Definiteness of Form

The last of the natural attention values that the speaker may use is definiteness of form. Though not every speaker is in a position to arrange the sounds of his message into patterns recognizable as music, he nevertheless does, by his grouping of words into phrases and by the inflectional patterns of his voice, approximate the definiteness of musical forms. There is no attempt here to suggest the use of a regularly repeated pattern of pause or pitch to create meter. The existence and use of repeated metrical forms in speech is dangerous because of the resultant monotony. But phrases and sentences should be definite and easily discernible by the auditor. As such, they will have the definiteness of form that will function as a factor in attention.

The natural or unlearned attention values just considered are not the only factors that the speaker may use in maintaining attention. The speaker has also the wants, interests, and attitudes of the audience to work with. The presentation of stimuli which may satisfy the wants and needs of the audience, and which are in keeping with its interests and its learned attitudes, will help the speaker to

maintain attention. To appeal to the wants, interests, and attitudes of the audience is not only a speaker's privilege but his obligation. The performer who makes no effort to gain a proper knowledge of what the audience members like or dislike, need and want, and what attitudes the individuals in the audience are likely to have, courts and deserves their scorn.

The Spread of Attention in the Audience

Every public speaker, no matter how expert, has at times felt disheartened because part of his audience was not attending and seemed, for a time at least, to be lost to him. The performer's efforts to capture the attention of part of the audience were of no avail; attempts at adjustment of subject matter, appeals to interest, all proved fruitless. Curiously enough, not always was the same part of the audience inattentive, though the individuals on the fringe or periphery seemed to be more frequently inattentive than those close to the center of the assembled group. How shall we account for the non-attentive group and for the fluctuations in attention from all members of the group? Attention, we said earlier, tends to lapse. During the lapse muscular tensions are relieved, and the organism rests to prevent possible nervous enervation. Now, an audience is made up of individuals who respond to one another as well as to the speaker. Their mutual responses function on an empathetic basis; one individual in an audience unconsciously imitates the muscular tensions of another. Hence, the tensions of groups of people within the audience will tend to be similar; tension and relaxation, attending and non-attending, will take place almost simultaneously, beginning probably with one or two of the most

susceptible members of the group and spreading to other members within the group. If a peculiarly uninhibited individual happens to be present in a group, his relatively uncontrolled muscular changes will be readily though not consciously perceived by other members of the group and will serve as stimuli for empathetic responses. Thus attention will wax and wane within groups in the audience. If the period of a waning attention is not too long, the speaker should not be discouraged. Attention, he must remember, does not persist; the lapses are necessary to enable the members of his audience to rest, recover, and respond anew.

Hollingworth [10] presents the results of several experiments that answer the question, "How does the speaker's influence spread from the platform and through the audience?" One experiment, performed by Clark,[11] indicated that the influence of a speaker starts with the most susceptible person or persons and from these centers radiates in local areas. In Clark's experimental situation, the audience of college students watched the instructor preparing what were supposed to be aromatic liquids, but which were actually colored waters. Each student was asked to record his seat number, and the elapsed time before he detected the new odor. One fifth of the one hundred and sixty-eight students present reported smelling a new odor. Since there was no actual odor, the sequence and location of positive reports were used as an indication of the spread of the suggested effect – the detection of the odor. The chief conclusions drawn by Clark were: (1) That the members of a group are more readily influenced by verbal instructions

[10] H. L. Hollingworth, *The Psychology of the Audience*, pp. 46–48.
[11] H. Clark, "The Crowd," *Psychological Monographs*, XXI (1916), 26–36.

than is the isolated auditor. (2) That instead of proceeding by regular waves, the influence first affects a number of especially susceptible persons in the order of the favorableness of their positions, and then radiates from them for a certain time period. (3) That there are clearly marked spatial and temporal optima for the influences exerted upon the crowd.

Hollingworth [12] presents the results of another series of experiments performed and summarized by Griffith. In a study of grades received by university students who were seated in different parts of a room, it was found that students on the outskirts of an audience were more apt to get low grades than students in the center. Since lower averages fell not only at the back, but at the sides and even at the very front of an audience, the inability to hear the lecturer or see the demonstration could not be the cause. Moreover, the center area of high averages traveled with the size of the audience so that in a large audience the area of high grades very often coincided with the area of low grades for a small audience.

From these and from other facts the conclusion was drawn that individual differences in performance may be due to the degree of social integration. Individuals in the periphery of a crowd are apt to be restless and inattentive to whatever may be attracting the interests of the main group, whereas physical compactness and the interests and activities of a group polarized toward the speaker may knit together the main body of an audience. In other words, "the heart of an audience is organized not only toward the speaker but with respect to itself."

To sum up, both Clark and Griffith found that individuals on the periphery of a group were apt to be less atten-

[12] *Op cit.*, p. 48.

tive than persons near the center of a group. This can most likely be explained on the ground that persons on the fringe of an audience are less susceptible to empathetic influences than persons near the center. The fewer the people near an individual, the fewer are the muscular tensions to which he is exposed, and the smaller therefore the opportunities for imitative empathetic responses.

CHAPTER FIFTEEN

INTEREST

Attention and Interest. Do we attend to situations because we are interested, or are we interested because we attend? We know that attention and interest are associated, and we shall soon see that they are almost inseparable. We have already characterized attention as an expression of the fundamental unity of the co-ordination of behavior which makes for clarity of stimuli and readiness of response. By interest we mean the maintenance of attention. As with attention, there are natural values or factors which make for interest. These include animation, vitalness, suspense, similarity, novelty, and concreteness. We shall consider these factors in turn.

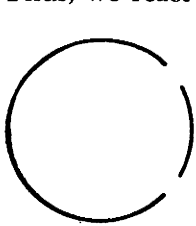
Natural Factors of Interest

1. *Animation.* Animation implies variation in stimuli. This has already been considered as an important factor in securing audience attention. Animation, in effect, is a phase of variety or change. When a stimulus has succeeded in evoking a complete response in an individual, it loses its potency for causing further responses in that individual; it ceases to be a stimulus. When the stimulus changes in any aspect it becomes a different stimulus, and so can evoke responses anew. Each reaction of an organism to a stimulus is an adjustment to a new situation. The continued adjustment brought about by the existence of ever-changing stimuli is animation.

2. *Vitalness.* There is none among us so cerebral that bodily needs and demands ever cease to be important in

motivating our conduct. Most of us admit to being interested in anything associated with the satisfaction of our physiological needs. A person who is about to have his appendix removed becomes deeply interested in tales of the operating room. Parents of infants are much more concerned than are most bachelors about news of epidemics of children's diseases. Most of us are interested in news of drought and flood because such catastrophes may directly affect our lives. All of these special interests are related to the physiological needs common to normal people.

3. Suspense. When a situation is incomplete, suspense is created. Most of us are annoyed by incomplete situations, and most normal individuals seek to avoid annoyance. But what are we to do when we are presented with an incomplete situation? When we become aware of the incompleteness of a situation we seek somehow to complete it. Sometimes we succeed by "filling in" the missing parts. Thus, we react to the figure below as if it were a circle,



even though the lines are broken and the circle is not present in its entirety. When we are unable readily to "fill in" the situation, and so complete our reaction to it, interest in the situation continues until a time when we have had an opportunity to react to the whole situation. The element of incompleteness accounts for our interest in puzzles, serial stories, and the mystery motion picture or play.

An important aspect of the incomplete situation is *conflict.* Whenever a situation is characterized by conflict or struggle, and the opposing forces are fairly matched, the outcome is in doubt, the situation is incomplete. Hence we continue to react to it. We may be active participants

in an incomplete situation, or we may be mere observers. If we are active participants, as we may be if we are playing on a football team, or answering an "ad" for a position, the outcome is of real concern to us, and may affect us pleasantly or unpleasantly for a short or long time. If we are observers, we react empathetically to the situation, even though the outcome may not affect us a few moments after the situation has been completed. A baseball or a football game between evenly matched teams is of interest to us even though we are only observers. That is why organized professional baseball has long been a major American industry, and why professional football is rapidly growing in importance. The owners and managers of professional teams recognize the human interest in watching a closely fought match. Wise managers in the "big leagues" try to keep contests on a fairly even basis, so players are bought and sold by the various teams, and occasionally a manager breaks up a "super" team by selling some of his better players to a rival club.

4. Similarity and Novelty. When we meet "new" elements in a situation we are able to react to them only in so far as the "new" elements resemble others to which we have at one time reacted. The repetition of situations too much alike will result in a feeling of monotony; the presentation of completely new situations to which the individual cannot respond with any of his established patterns of behavior may bring about a state of emotional instability. We generally, knowingly or unknowingly, strive for a state of equilibrium, one between the two extremes in which neither too little of the novel nor too much of the familiar is present. We prefer a state in which enough of our preestablished patterns of behavior is preserved to prevent

extreme diversification and difficulty of response, and sufficient variety is introduced to prevent monotony. We maintain our interest in situations which are similar to others we have experienced; we avoid situations which are too new, too different.

5. *Concreteness.* It is easier to deal with the concrete than the abstract, and most of us prefer to deal with what is easy. The abstract, the symbolic, are difficult to comprehend. But there are some of us who scorn the simple as presenting no challenge, and hence no interest. Nevertheless if we wish to keep others interested in a situation we must adopt some rule of thumb for knowing how much of the concrete and how much of the abstract we may present. In general, the less intelligent, the more naive the reactor, the simpler and more concrete will be the situation to which he will respond.

Interest in the Speaker-Audience Relationship

1. *Animation.* To continue holding attention, to establish interest, the speaker must present a variety of stimuli. Varied stimuli, as we have seen, require constant adjustment on the part of the reactor. When the speaker furnishes his audience with a sufficient variety of stimuli, the individuals in the audience will make appropriate adjustments, and so continue to attend. Of course, the different stimuli should not be presented in such great number and with such rapidity that even partial adjustment on the part of the reactor will become difficult. Such a condition will soon result in an emotionally disorganized state verging upon chaos. If recovery and adjustment become too difficult audience members, in self-defense, soon cease to attend to the speaker.

The speaker can furnish his audience with variety either in thought or in method of presentation, or both. He must be ever alert to pass from one point to the next, never dwelling too long on any one item, no matter how important he deems it to be. If the speaker is reluctant to leave a point, he must at least be certain that he presents it differently while he dwells upon it for emphasis. Repetition is dangerous because it may become tiresome. When we have completed our reaction to a situation we seek a new one. If the speaker fails to present it to us we go mentally afield on a voyage of discovery. The speaker must prevent his audience from taking mental leave of him by furnishing his listeners with a variety of stimuli through his words, his voice, his actions, and his manner. If the speaker's thoughts and method of presentation are sufficiently varied, he will himself be a fertile field of interest. Voyages of discovery will become unnecessary.

2. *Vitalness.* One of the most fundamental ways of maintaining interest is to tell people things that really concern them. So much of our behavior is determined by our physiological and psychological needs and wants that human interests unrelated to them are rare enough to be oddities. It is the speaker's task to relate what he has to say to the needs and wants of the members of his audience. His purpose must be one with theirs. He should not tell his audience why *he* wants a candidate elected. Instead, he should tell them why *they* ought to elect the candidate. If the speaker wishes to tell his audience about a trip to Africa, he should not tell them about *his* trip, but instead ask the audience to go along with him on the trip they have so much wanted to take. "Now at last we are able to delve into the jungles of Africa. As we approach the edge of the veldt, etc." The speaker who touches upon his au-

dience's wants and needs, who brings them to the surface and relates them in no uncertain way to the context of his talk, goes a long way in the direction of maintaining interest.

3. Suspense. The speaker uses suspense, or as Overstreet[1] terms it, the "chase technique," for maintaining interest when he presents only part of a total situation. The audience members attend because they wish to have the entire situation revealed, and so relieve an initial state of strain. The speaker must be certain not to disappoint his listeners when finally he does present the completed situation.

Conflict, which we have considered as an aspect of suspense, may easily be brought into a discussion by a speaker. If his subject is "Labor," it can readily be presented as a struggle between the working people and the moneyed class. Ideas as well as people may be lined up and set as opposing forces in a struggle. We are all of us interested in struggles; we are most interested in struggles which directly concern us, but any conflict is better than no conflict.

The Similar and the Novel. The factors of similarity and novelty in a speaker-audience situation are closely related to the most fundamental of attention factors, variety. People, we have noted, strive for a state between the two extremes, in which neither too little of the novel, or too much of the familiar is present. This tendency is present in both speaking and listening. In any normal speaker-audience situation the speaker must furnish the auditor with sufficient variety to maintain interest. If too much of the novel is introduced, the listener will be unable to follow the discussion; if there is an insufficient amount of the

[1] H. Overstreet, *Influencing Human Behavior* (W. W. Norton and Co., 1925), p. 13.

novel the listener will find the situation too dull to warrant continuous attending. For successful discourse the speaker must determine and adopt a rate of diversification equivalent to the listener's rate of absorption. The experienced speaker will not take long to determine what this rate should be. Wandering attention, yawning, and nodding by members of the audience are signs that too little of the novel is being presented. Nonplused expressions and seemingly irrelevant questions serve as warning cues that too much of the new and too little of the old are being presented. Because these signals of dissatisfaction are present, though perhaps latent, in every auditor, they should easily be recognized by the speaker. Once recognized, it becomes the speaker's task to adjust his subject matter in such a manner that the audience may respond to the situations presented without becoming bored or emotionally unstable.

Concreteness. Personalities, men in the limelight, are concrete. The principles and ideas for which they stand are abstract. Most people prefer to deal with the concrete, because it is easier than dealing with the abstract. Whenever possible, the speaker should choose a personality and present him to the audience as the embodiment of the principles or ideas he wishes to discuss. Washington represents the nation's fight for independence; Samuel Gompers represents the American workman fighting to improve his working conditions. How simple, how concrete should our presentations be? Most people prefer the simple; some of us who are ambitious to be considered sophisticated may become annoyed with a too simple, pictorial presentation and unfavorable reaction toward the speaker may result. The speaker will be wise to keep the material sufficiently complex and abstract to be challenging.

In our discussion of the factors of interest we have tried to make it clear that it is the task of the speaker rather than the duty of the auditor to maintain audience attention, and establish interest in the speaker's discourse. In most audience-speaker situations the audience is partly, if not wholly, polarized at the outset of the speaker's discourse. Initial attention is easy to maintain. Audience curiosity is generally sufficiently great to result in such attention. Once having gained the audience's ear, it becomes the speaker's task to hold it. If he fails, he usually has no one but himself to blame. Inattentive audiences are not born; they are made by poor speakers.

CHAPTER SIXTEEN

IMPRESSIVENESS

When we speak about the impressiveness of a stimulus we have in mind its strength, or potency, – the influence it exerts in bringing about a specific reaction. Most of the data concerning impressiveness of stimuli have been gathered in connection with experiments in the psychology of attention. We have presented some of the findings in our discussion of intensity as a natural attention value (see pages 215–216). Intense stimuli, such as loud sounds, are generally more potent in gaining attention, and, hence, in causing reaction, than are weaker stimuli. In general, we might also say that stimuli present for a longer period of time are more potent than stimuli present for a shorter period of time; e. g., a stimulus that lasts a second is more impressive than a stimulus that lasts only one fifth of a second. Thorndike [1] has shown that the primacy of a stimulus or a situation makes for potency in impressiveness. Another factor making for impressiveness is repetition of the stimulus. In the Thorndike experiments a word such as "marble" was said three times before presenting a number with which it was to be connected thus: *"marble, marble, marble, 61."* The repetition of a stimulus is probably equivalent to an intensification of the stimulus, gaining in impressiveness by adding strength to whatever connections it makes.

The problem of repetition of stimuli is closely related to the problem of distribution of stimuli. What is the most effective way of repeating stimuli in working for impres-

[1] E. L. Thorndike, *The Fundamentals of Learning* (Bureau of Publications, Teachers College, 1932), pp. 131–147.

siveness? In a series of experiments in which words were to be connected with numbers Thorndike [2] found that up to six repetitions, concentration (successive repetition), is better than distribution. A desired connection or relationship should be repeated often enough at its first appearance to make that connection or relationship sufficiently strong to overcome the effects of time and other situations which may interfere. When there are more than six repetitions, the desired connections should be distributed in time, to avoid the weakening effect that may result from monotony.

Although the situations one meets in confronting an audience are not directly comparable because of their complexity to the relatively simple and well-controlled situations that psychologists have set up in experiments to study the impressiveness of stimuli, the general experimental findings, we believe, are applicable. We will apply these findings in our continued study of the audience-speaker relationship.

Impressing an Audience. The speaker who has succeeded in winning attention to himself, and in interesting an audience in what he has to say, has for his next task that of impressing his audience. Unless he succeeds in making an impression, unless he can drive home his thesis, the efforts he has expended in winning the attention of the audience and in maintaining interest are largely wasted. In this discussion we are interested only in the objective and measurable elements of impressiveness. The subjective elements such as the personal appearance, the manner and mannerisms, the diction, voice quality, force, etc., of the speaker are not to be ignored. We have, however, no easy means of measuring these elements as aids to impres-

[2] *Op. cit.*, pp. 148–151.

siveness, though few would dare to doubt their importance or question their potency in a speech situation.

Visual versus Oral Presentation. In most speech situations, the speaker causes reactions in his audience by presenting both visual and auditory stimuli. In some speech situations, as in radio speaking, only auditory stimuli are presented. In others, as when a pantomimist performs, only visual stimuli are presented. Sometimes each type of stimulus is presented in turn; more usually both are presented together, for a time at least. The speaker using gestures presents visual stimuli to accompany the auditory. The lecturer using slides or charts or illustrative material of any sort which is explained orally, is presenting both types of stimuli to his audience. Those of us who have attended lectures at college will recall that the lecturer generally first presented the diagram or the picture before any explanation was given. Frequently, of course, an introductory word was said about the visual material before it was presented, but the actual explanation followed the presentation of the material. This technique is based upon good experimental evidence. Diagrams, pictures, and other visual material are more effective when they precede rather than follow the oral explanation.

The value of visual aids depends upon the complexity of material presented and the relative intelligence of the audience. If the visual material is as complex as the explanation of it, little is gained by its presentation. On the other hand, there is real danger in the use of simple, pictorial material with sophisticated groups. Such groups may feel insulted or belittled when the speaker uses simple materials, and may react unfavorably. Though no hard and fast guiding principle can be laid down for the use of illustrative material we may in general say that if the

speaker is dealing with a heterogeneous group, the simpler and less symbolic the material the greater will be the efficacy of its use in effecting universal comprehension. The less sophisticated, the less intelligent, the simpler the group, the earlier, the more pictorial, the more graphic may be the method of presentation.

Reading versus Speaking. The public performer must frequently decide whether he is to read from manuscript or present his speech without recourse to written aid. Shall he read or shall he speak? No categorical answer can be given because any answer necessarily is dependent upon the factors surrounding each particular speech situation. Certainly an individual who has no confidence in his ability to address an audience without reading from manuscript and who is able to draw the needed confidence out of the typed sheet he holds, ought to read. Both he and his audience will probably be grateful for the decision. Quotations are perhaps always better read than presented from memory. They seem to have greater effect – the authority of the written word – upon an audience. A read quotation will not unduly distract the audience with an impression of the amazing memory of the performer. Read speeches undoubtedly have their place. Generally, however, and other things being equal, we believe that spoken speeches are more impressive. The results of an experiment by H. T. Moore [8] help to substantiate this contention. Moore made a study of the comparative impressiveness of a five-minute selection on the life and scientific work of Helmholtz when read and when spoken to college classes. The results indicated that the class to which the material was delivered in free utterance (no reading) remembered 36%

[8] H. T. Moore, "The Attention Value of Lecturing without Notes," *Journal of Educational Psychology*, X (1919), 467–469.

more than the class to which the material was read from manuscript. Moore concluded that audiences are more disposed to attend to (and we add to be impressed by) material freely uttered rather than read.

The Use of the Voice in Impressing an Audience. The human voice, in common with all other sounds, has as its attributes pitch, time, quality, and intensity. All of these attributes are at the disposal of the speaker in his endeavors at making an impression. The more extreme the change in pitch, in tone quality, in intensity, or in time, the greater will be the impressiveness of the voice. Woolbert [4] measured the impressive influence of various types of reading. Stories were read to small audiences by trained readers who adopted a particular mode of reading throughout a given performance. After a lapse of five days, tests of impressiveness were made by measuring the listeners' correct memories for the facts of the story. Woolbert found that either extreme change of voice quality or a combination of changes in *all* the attributes of sound were most impressive.

In general, we are more impressed by variety than by sameness. Small changes may not be noticed, larger changes cannot escape attention. Of course, no speaker should use his voice so that the audience attends to the voice rather than to what the voice is saying. Nor should change ever be made for its own sake. The degree of change should be determined by what is said, where it is being said, and to whom. The speaker delivering an address in a large auditorium to a vast gathering should employ more extreme voice changes in making his impression than the speaker addressing an intimate group. The speaker with an intimate group should not overlook the use of the attributes of

[4] C. H. Woolbert, "The Audience," *Psychological Monographs,* XXI (1916).

sound in making his impression; he must merely be careful that the range of differences be moderate, in keeping with the speech situation.

As we have previously brought out, the beginning of any discourse is the time in which the speaker makes his greatest impression. Then, if ever, he has maximum attention. Unless the speaker has established an unfortunate reputation which has preceded him, the audience is naturally curious to hear what he has to say. Because of this natural and passive attention, whatever the speaker says first will make a strong impression upon the audience. It is important, therefore, especially in an argumentative address, that the first statement contain the meat, the essence, the most important part of the speech as a whole. The performer who is profligate with his opening moments, who wastes his opening statement by telling a funny story merely to gain attention which he already has, especially if the funny story has little or nothing to do with the purpose of the speech, deserves little sympathy. A funny story at the opening of a discourse may impress the audience with the notion that the speech is to be humorous. If the supposed funny story is lame, or old, or difficult to understand, the audience will be impressed with the subsequent discourse according to their reactions to the story.

Repetition. Repetition is the most important single device for gaining emphasis with an audience and so reinforcing the impression. The most effective way of using repetition is to space or distribute the statement to be emphasized over the entire discourse rather than to mass the repetitions at one point. The effect of repetition diminishes considerably after several declarations. Certainly no speaker should repeat any statement so often that the audience is bored because of insufficient variety of verbal utterance. As is the

case of so many other factors in the audience-speaker relationship, the frequency of the use of repetition should vary with the type of audience and the subject matter being presented.

CHAPTER SEVENTEEN

MOTIVATION

The amount of organized human behavior that is not determined by an individual's wants, interests, and purposes is so small as to merit attention only because of its rarity. Not always are these inner drives – the wants, interests, and purposes – known to the behaving individual. So much of a role do these drives play, and so early do they assume their part, that their very ubiquity and familiarity make them indistinguishable from the conduct which they motivate. Only when something goes amiss and runs contrary to our deep-seated drives do we become cognizant of their existence.

All our wants may be traced back to original states of satisfaction and irritation or unsatisfaction. Our interests and purposes generate from these states of satisfaction and annoyance. We must not make the mistake of confusing satisfaction with pleasure, or annoyance with pain. Situations *may be painful, and still decidedly satisfying.* "A large percentage of the states of affairs which are satisfying or annoying are not so because they contain emphatic sensory pleasures or pains, or because they bring general joy, contentment, depression, irritation, or the like to the mind as a whole, but because they satisfy or thwart some particular purpose. The appearance of a satisfaction or annoyance is, then, very often proof of the existence of a purpose." [1]

Many of our basic drives are difficult to recognize because of the civilized appearance which they assume.

[1] E. L. Thorndike, *Fundamentals of Learning,* pp. 397–398.

Others may perhaps seem to be absent because they have either been sublimated or suppressed. Occasionally, drives may come into conflict with each other and one may be compelled, temporarily or permanently, to give way to the other. For example, though most of us crave a social existence, occasionally, as when writing a book, the individual seeks solitude. We are, of course, not primarily interested in the unusual situation. We are more interested in the normal situation and in the behavior of the human individual in such situations. To understand such behavior we will turn our attention briefly to a consideration of the fundamental drives which affect normal human behavior.

Fundamental Human Drives

1. Human beings direct their activities to the satisfaction of physical wants and general physical well-being. They avoid, if possible, situations that may bring about physical deprivation, including pain, hunger, thwarting of sex demands, and a need for sleep. Any one of these deprivations may, however, be suffered temporarily; the individual may knowingly enter into situations which will for a time result in deprivation if he believes that there will be ultimate satisfaction.

2. Human beings normally behave in ways that will lead them toward success, mastery, and achievement. They try to avoid situations that may result in thwarting, frustration, and disappointment. Once again, we must realize that persons frequently knowingly accept temporary disappointment for a promise of future success or achievement.

3. Human beings tend to behave in ways that will help them to gain recognition, admiration, respect, and ap-

proval. They avoid moves that may result in their being ignored, or looked down upon, or merely tolerated. Yet all of us recognize that temporary disdain may be suffered for the possibility of more lasting respect; today's sneers may be accepted for the sake of tomorrow's cheers.

4. Human beings generally act in ways that will lead toward their being loved, and the realization of a feeling of being wanted. They tend to avoid the unwanted, non-belonging feeling. Usually, human beings prefer to be with other human beings rather than to be alone, and to be with familiar human beings rather than with strange ones. Exceptions, however, are notable. The lone aviator flying to distant lands and strange people, the recluse who flees from all human society, are motivated in their actions by other drives which may for them be more fundamental – at least at the moment of the initiation of their activities.

5. Human beings usually act in ways that will bring about peace of mind, security, and a feeling of release from worry and anxiety. They generally avoid the bringing about of situations that may result in worry, anxiety, or fear.

6. Finally, human beings indicate by their behavior that they seek some adventure, new experiences, and zestful living. They tend to avoid boredom and monotony. The amount of adventure, the number of new experiences sought by man, is a highly individual matter. The person responsible only to himself may frequently undertake activities that will bring him into situations which are new and perhaps dangerous, for the sake of zestful living. The more responsible man – the typical head of a family – will usually suppress his desire for new experiences in exchange for the often humdrum security of the home. In general, however, individuals seek a state of existence with

enough novelty of situation to prevent monotony, and yet not so much novelty of situation that will make living difficult because of the necessity for making continuous adjustments to too rapidly changing situations.

The Relationship Between Drives and Interests and Attitudes

The basic drives which we have just considered are for the most part concerned with the preservation and continuance of the physical and mental well-being of the individual. Nor is there any clear-cut distinction between the physical and the mental. These drives are not learned; they are universally present in all naive human beings. The changes, suppressions, and modifications that take place in these drives are usually the result of environmental influences. They are learned, and the individual who makes the modifications may no longer be considered naive. For the most part, however, drives remain basically the same with most normal human beings.

Interests and attitudes are learned. The basic determining factors in the formation of our interests and attitudes are the fundamental human drives. Our interests evolve because they are necessary for our purposes – essential for non-interference among the drives which motivate us. Although for the most part interests and attitudes are not consciously learned, *they can be taught, and have actually been taught* in controlled experimental situations. The basic principles of learning, repetition and reward, seem to operate with interests, attitudes, and tastes as they do with the learning of ideas and skills. The author [2] demonstrated the teachability of tastes in an experiment which

[2] J. Eisenson, "Confirmation and Information in Rewards and Punishments," *Archives of Psychology*, 181 (1935).

involved the reactions of people to Christmas cards. The directions for this experiment will help to throw light on the nature of the procedure and the task.

> This is an experiment in aesthetics. I am going to show you Christmas cards which were rated by a group of competent artists on a basis of 1 to 20. You are to rate these cards on a similar basis. Call a card which you consider very fine, 1, and one you consider very poor 20. The numbers between 1 and 20 correspond to intermediate judgments on this scale. You are at liberty to use any number from 1 to 20 which corresponds to your judgment of the cards. At various times I shall say, "Excellent," or "Very Good," or "Good," or "Fair," or "Poor," or "Very Poor" as criticisms of your judgment.

In this experiment the prestige value for the subject of "Excellent," and "Very good" was sufficient reward to result in the subjects' changing their judgments (tokens of their tastes in the matter of Christmas cards) to fall in line with the supposed judgments of supposedly competent judges. When there was original agreement between the subjects and the "judges," the subjects' judgments were maintained and exactly repeated about 40% of the time. When there was no original agreement the subjects generally changed their ratings in an effort to be in accord with the opinions of the "judges."

Thorndike has experimented intensively in the fields of wants, interests, attitudes, and tastes. In his *Psychology of Wants, Interests and Attitudes* he presents a series of experiments the results of which permit him to conclude that ". . . a person can be taught new attitudes and tastes as surely, though not as easily as he can be taught facts or skills." [3] Interests, attitudes, and tastes then, *can* be taught

[3] E. L. Thorndike, *The Psychology of Wants, Interests, and Attitudes* (D. Appleton-Century Co., 1935), p. 189.

and *are* learned. The teaching may be direct and the learning conscious; more usually, the processes of teaching and learning are indirect and unwitting.

Motivation in the Speaker-Audience Situation

Persuasion. Hollingworth [4] defines persuasion as the "act of holding the favorable attention long enough for the stimulus to enter into effective combination with other effective processes in consciousness." Persuasion is used whenever the speaker wishes to gain control over his audience so that he may direct the actions of the individuals in the audience according to his (the speaker's) purposes. Essentially, persuasion is a process of initiating certain patterns of action in an audience and of blocking off others which might, if allowed to continue, prevent or interfere with the continuance of the action patterns the speaker has initiated and later wishes to direct. We have already discussed methods of gaining and holding attention, and of making stimuli impressive, the first steps in the act of persuasion. We are now ready to consider how a speaker may complete his task in an audience situation – initiate and direct activity.

The fundamental bases for action are the human drives which we have considered earlier. These drives are intimately and indistinguishably associated with our mental and emotional lives. *Almost all human action is based on desire.* This should be the speaker's guiding principle as he seeks to persuade an audience. Specifically, the speaker's task is to determine audience drives and to align his own ideas with theirs. The process of alignment is basically a teaching process which, because most audiences dislike be-

[4] H. L. Hollingworth, *Advertising and Selling* (D. Appleton Co., 1913), p. 133.

ing taught, must be carried on indirectly and by suggestion. Hollingworth [5] lists seven laws of suggestion [6] which we shall consider:

1. "The strength of a suggestion depends in part on the degree to which it seems to be of spontaneous origin, an act of the individual's own initiative. . . . The more indirect the suggestion, the more it can be made to be an original determination or plan or conclusion on the part of the listener, the greater its dynamic power." We have already shown how interests, attitudes, and tastes can be taught, and that the teaching is seldom direct and the learning is rarely on a conscious level. The speaker must so arrange the situation that any judgment made, any taste displayed, any interest shown in an idea, must seem to originate from members of the audience. It is, of course, a fortunate coincidence if the speaker can let his audience know that others agree with their judgments, tastes, or interests.

2. Hollingworth's second law of suggestion needs no expansion. "Within the limits of the law just indicated, the dynamic power of a suggestion will be greater, the more forcefully and vividly it is presented. This is especially true when the suggested act is in harmony with the preestablished habits and tendencies. When the suggestion violates life-long habits and instincts, attempts to be forceful and vigorous usually lapse into arrogance and thereby defeat their own purpose."

3. In the teaching of attitudes, as in teaching and learning in general, the efficacy of rewards is known, the efficacy of punishments is questionable. The speaker who re-

[5] H. L. Hollingworth, *The Psychology of the Audience*, pp. 142–144.

[6] "When we accept an opinion uncritically, using it as a basis for our belief or action, we may be said to respond to a suggestion" (Allport, *Social Psychology*, p. 242).

wards his audience, who aligns the suggested act with pre-established tendencies, may be sure of success. The speaker who uses punishment to break down existing attitudes or emotional tendencies is likely to have difficulty. Hollingworth states, "It is more effective to suggest the desired response directly than it is to argue against a response that is not desired."

4. The fourth law of suggestion holds that "The action power of a suggestion varies directly with the prestige of its source." It is more efficacious to have the audience agree with a president than a vice-president. Agreeing, or finding that a superior agrees with one, is pleasant and a source of satisfaction.

5. The fifth law will be stated in detail. "The strength of a suggestion will be determined in part by the degree of internal resistance it encounters. That suggestion will be most effective which can call to its aid or appropriate the dynamic force of some other impulse that is already active or latent. Suggestions to violate life-long habits, firmly fixed moral feelings, and sacred relationships are impotent, even during the pronounced suggestibility of the hypnotic trance."

The speaker who succeeds in reinforcing the emotional drive he is calling into play with the energy of drives already at play, will find his suggestions more readily acceptable. The sex drive and the desire to be loved are frequently combined in life. The desire to avoid frustration and win respect are other cases in the point. On the negative side, the speaker who violates lifelong habits or moral feelings of the audience by his suggestions is doomed to failure. Yet speakers frequently find themselves in predicaments where they are in danger of antagonizing the audience. What are such speakers to do? Religious toler-

ance was established in the Maryland colony when a speaker was able to convince the then Catholic legislature that unless the Protestants were allowed to worship as they chose, they might, when they were in a majority in the colony – and such a majority was imminent – refuse to allow Catholics freedom of worship. Where a direct appeal for religious freedom would probably have resulted in failure, an appeal for the preservation of existing conditions, which brought about the same result, was successful.

6. The sixth law deals with repetition and attention. "The strength of a suggestion varies with the frequency with which it is met. But mere mechanical repetition avails little unless the repeated suggestion is attended to with interest." The question of repetition for emphasis has already been discussed. We will merely add here that a suggestion or an appeal should be varied in content to maintain interest.

7. The last law holds that "In appealing over the short circuit or a specific line of action, no interference, substitute, rival idea, or opposing action should be suggested. Such an idea merely impedes the action power of the first suggestion, by inviting comparison and this invites deliberate choice and hesitation." The practice of setting up straw men to be knocked down has its dangers. Success in knocking one down is no great achievement; failure may be disastrous. The speaker who suggests ideas that oppose his own may be arguing successfully for his opposition.

Immediate or Delayed Response. The speaker who is able to direct his audience into immediate lines of action at the close of his discourse is fortunate, but such fortune is rarely the lot of the speaker. Usually there is an interim between the speech and the time for the desired performance. During this lapse, and varying directly with

the length of its duration, the probability of getting no result, no action, increases. How to get action despite delay now becomes the speaker's problem.

In situations where there is a waiting period between the original stimulation of the individual and the time when the desired reaction may be completed, we are dealing with precurrent responses. We may define precurrent responses as adjustments that the individual makes which get him set and prepare him for a final or consummatory reaction or response. Precurrent responses may continue for an indefinite time. Usually they become more potent the longer they wait for consummation. Occasionally, environmental and physiological changes may decrease the potency of precurrent responses. The feeling of hunger is dulled when not satisfied in proper time. The individual still needs food but the urge to satisfy his hunger is gone, and so nothing may be done to obtain the food. Prolonged starvation may result in changes in the organism which may make normal eating impossible. In the speech situation, fortunately, the speaker almost always deals with the type of response which is reinforced rather than weakened with the passing of time. The directing of audience tendencies by the reinforcement of precurrent responses is one of the tasks of the speaker. O'Neill and Weaver say, "The business of the speaker in controlling conduct is largely a matter of calling into play and reinforcing emotionally all the precurrent responses which will keep driving the reactor in the right direction, so that in the interim between the end of the speaking and the coming of an opportunity to perform the consummatory response, the wish may be present." [7]

[7] J. M. O'Neill and A. T. Weaver, *The Elements of Speech*, pp. 274–275.

Emotion and Rationalization. The choice of the emotional tendency or drive to be used should be a matter of great concern to the speaker. His particular speech purpose, the nature of the audience, and his own nature and personality are all factors that enter into his selection of the drive or emotional tendency to be called into play. The length of time and the degree to which emotional elements may be used vary with the speech situation. In dealing with a heterogeneous audience, an emotional appeal is more likely to achieve success than an intellectual appeal. The individuals composing any audience are more apt to resemble one another in their instinctive and emotional behavior than in their intellectual behavior. Most audiences, however, rather like to believe that they are acting intellectually and logically. They may indeed become quite emotional when told the contrary. The speaker will be wise, therefore, to give the members of his audience an opportunity to believe that their actions have a logical basis. The rationalization appeal, so popular with all of us, should be called into service. In the rationalization process an attitude or a conclusion aroused in us emotionally, is then justified on logical grounds. We do what we want to do, and then find reasons for doing it. We do not suggest, of course, that the speaker become a rabble-rouser or a demagogue. There are occasions, however, when a speaker is dealing with an audience which can be moved emotionally and not logically, but which insists on logical justification for its actions. The speaker dealing with such an audience has recourse to the rationalizing appeal. No audience has its beliefs based on evidence alone. Beliefs are always colored and warped by desires, wishes, and hopes. It is the speaker's first job to determine the audience's desires, hopes, and wishes, if he can, and align

them with the idea or notion he wishes to convey. After that has been done he may present his logical proof. The audience will be satisfied and the speaker justified.

Persuasion and the Personality of the Speaker. We have thus far said nothing of the personality of the speaker as a force in persuasion. Our avoidance has been intentional, and in general keeping with one of the underlying forces that motivates this writing – to consider as far as possible those aspects of speech which if not actually measurable are at least discernible. Personality, from the Behavioristic point of view, is discernible if not measurable. West talks of personality in terms of muscle tensions:

> When the tensions of the speaker's muscles are such that the perception of them is agreeable and pleasant, that is, when they stimulate the observer into activities which for him are pleasurable, the speaker is said to have attractive or magnetic personality. Conversely, when the speaker's muscle tone is such that the observer feels uncomfortable, strained or unpleasantly relaxed, the speaker is said to have an unprepossessing, unattractive, or negative personality.[8]

The observer's impressions of the speaker's personality are usually subconscious. The process of impression goes on without actual awareness on the part of the observer that anything is happening.

The speaker whose personality is unattractive, who cannot arouse pleasurable feelings in his audience when such feelings are required, who cannot adjust himself – his muscle tensions – in accordance with the way the members of the audience would like their muscles to be tensed, begins with a handicap which, though not quantitatively measurable, is nevertheless appreciable and perhaps insurmountable.

[8] R. West, *Purposive Speaking* (The Macmillan Co., 1927), p. 126.

CHAPTER EIGHTEEN

STAGE FRIGHT

In the preceding pages, we have been concerned largely with a study of the nature of the audience and the tasks of the performer in the speaker-audience situation. The chief emphasis has been placed on what the speaker does, or should do, with the audience. Now we shall turn the spotlight and see what an audience may do, and all too frequently does do, to a speaker. Specifically, we shall study the phenomenon spoken about in hushed words by even the most experienced of public speakers – stage fright. We are not at all certain as to what happens to the seemingly well-integrated and apparently once well-adjusted person who before our very eyes is suddenly transformed by virtue of his appearance on a stage, in a pulpit, or before a microphone, into a panic-stricken, disintegrated, and evidently very badly-adjusted creature. Despite our uncertainty, we shall endeavor to throw some light on the subject by an examination of the findings of the psychologists who have been interested in this phenomenon.

The speaker suffering from stage fright may present one or a complex of any of the following symptoms: palpitation of the heart, trembling (the knees perhaps literally striking against each other), perspiration (usually cold beads of sweat standing on the forehead), dryness of the mucous membranes (especially noticeable in the mouth), paralysis resulting in immobility, and secretory and excretory disturbances. These symptoms are by no means confined to the performer on a stage. They have been reported by individuals confronting or about to confront a

relatively large group of people, no matter the place. Husband [1] asked a group of athletes to describe the emotions they experienced just before a game. Among the symptoms described by the athletes were: rapid heartbeat, frequent urination, hollow feeling of the stomach, and dry mouth. Essentially the same symptoms are described by most people who are novices in an audience situation, or even by experienced speakers before new or different types of audiences. The symptoms are indicative of physiological changes, which are in turn indicative of the existence of an emotional state brought about when the individual experiences a *change in the organization of responses.* In the section on Emotion and Speech (see pages 56–57) we emphasized the point that emotion is expressed while an organism changes its patterns of response and recognizes its mode of behavior. The physiological changes, including the increase in amount of adrenalin, and the psychological picture of disorganization, are readily apparent in stage fright. The existence of an emotional state is the outstanding and probably most important symptom of stage fright.

Theories of Stage Fright

1. Rivers [2] believes that stage fright is a *fear response* in which the typical adjustment of flight, aggressiveness, immobility, collapse, and manipulative activity are presented. According to Rivers' analysis, stage fright is an instinctive fear response, the reaction of the individual against the crowd. If in an individual fear is expressed by flight, he will flee from his audience. If fear is manifested

[1] R. H. Husband, "A Study of the Emotion in Excitement," *Journal of General Psychology,* XLVI (1935), 465–470.

[2] W. H. R. Rivers, *Instinct and the Unconscious* (Cambridge University Press, 1920).

in the performer by a show of aggressiveness, he may be stimulated to heightened activity and energetic action which he will apply in the actual speech situation. When the fear response is indicated by immobility and collapse, the performer may become too tense to move or speak; he may become blocked in his speech after he had initiated it, tremble, and appear generally inco-ordinated. Loss of memory, forgetting what one wanted to say, is characteristic. If the adjustment to the fear response is manipulative activity, the performer then overcomes his fear by engaging in the very act that brought it about – the appearance before a group. Many experienced speakers tell us that this is actually what does happen. The realization that they are "afraid" stimulates them and assists rather than inhibits continued responses to their audiences.

2. *Stage fright* may be a manifestation of *neurotic behavior* resulting from the conflict between two instinctive reactions, specifically, the longing for an audience and the fear of appearing before it. Whenever the two tendencies become equally potent in an individual, the emotional strain brought about by their conflict results in a neurotic approach to the speaker-audience situation. If stage fright is a neurosis, then a stage-frightened individual should be one prone to be a neurotic. Some indication of this is given by the findings of Elwood Murray.[3] In working with twenty-five superior and twenty-five inferior speakers, he found that the superior speakers tend to have high positive scores on the *Bernreuter Personality Inventory* in self-sufficiency and dominance and negative scores in introversion. The inferior speakers were negative in self-sufficiency and dominance and positive in introversion. An attitude of

[3] E. Murray, "A Study of the Factors Contributing to the Mal-Development of the Speech Personality, *Speech Monographs*, III, No. 1 (1936).

too great self-attentiveness, bordering on the neurotic, is undesirable for the performer, and conducive to the state of stage fright.

3. Opposed to the point of view that stage fright is an instinctive response is the theory suggested by Hollingworth [4] that stage fright is a *learned form of behavior,* "an emotional redintegration,[5] in which some disabling emotion is reinstated by the presence of some feature of the more complex situation in which the emotion arose." The present episode – the audience situation – has an element or elements in common with a past situation which originally resulted in a reaction of fear. The performer reacts with old responses to a new situation; the responses are unsagacious and inadequate; and stage fright is the result. Thus, the performer who was once frightened by a milling, rushing crowd may react to the moving heads in his audience as he did to the crowd which frightened him and manifest fear reactions in the form of stage fright. Goodhue [6] describes the case of a successful and popular opera singer who suddenly became panicky when appearing before an audience. An analysis of her case brought out the fact that she had recently been in a train accident in which the surging crowd had almost crushed her. The dread she had of this particular crowd was transferred to crowds in general, and appeared particularly when she found herself before an audience in the concert hall. We might be ready to accept Goodhue's explanation and Hollingworth's ready though perhaps "unsagacious" accord if we knew more about the opera singer and her status with the public and the company which paid her salary. Was it possible that

[4] H. L. Hollingworth, *The Psychology of the Audience,* chap. XIII.

[5] "Redintegration" refers to the establishment of responses in connection with reduced cues.

[6] M. L. Goodhue, *The Cure of Stage Fright* (The Four Seas Co., 1927).

the diva thought herself slipping? Was she losing her popularity? Was the opera company trying out a new singer to play her usual roles? Was she getting a reception from her audience which did not bring about the usual pleasant reactions from her? In short, had she a more immediate reason for being afraid of the present audience than the unwittingly recalled crowd in the train accident? If all these questions can be answered negatively, then perhaps the singer was really making an unsagacious, redintegrated response. If, however, an affirmative answer can be given to any of the questions we pose, her response may have been sagacious indeed. She was afraid and became panicky because she had a very good and very immediate cause to be afraid.

4. Lomas [7] suggests a theory with which we are in general accord. When an individual's pattern of responses are inadequate to meet a situation, ". . . when the configuration is broken, aimless but highly vigorous activity results. In speech we call this stage fright. But it differs from other speech emotions only in the degree of integration toward a definite goal." Stage fright is a manifestation of an emotion – probably that of fear – arising out of difficulty in coping with the speech situation. The individual's repertoire of responses is inadequate to meet the situation in which he finds himself, and so he must reorganize his behavior patterns for a more adequate response. If reorganization fails, the individual may ultimately solve his problem by fleeing from his predicament. Usually flight is not necessary, and the performer effects a fairly adequate reorganization of his behavior patterns so that the situation may be met through speech. The apparent procrastination before

[7] C. W. Lomas, "The Psychology of Stage Fright," *Quarterly Journal of Speech*, XXIII (1937), 35–44.

audible speech actually begins may be a silent reorganization period, a period in which the performer takes stock of his responses to determine whether the inventory will show a sufficient number to continue him in business.

It would seem at first thought that only novices in the audience situation should be stage-frightened, for only they are not beforehand aware of their repertoire of responses. When we realize, however, that each audience is a *new audience,* and that the audience-speaker relationship changes with the time, the place, and the environmental conditions as well as with the immediately past experiences of speaker and audience, we may conclude that the potentialities for stage fright are present in every speaker and in every audience situation.

Suggestions for Treatment of Stage Fright. Perhaps the best single piece of information to the performer who is in danger of stage fright is that all public speakers have at one time experienced this fear, and that many hardened and tried performers still experience fear in an audience situation. When the actress Eva Le Gallienne had just rounded out her one thousandth repertory performance, an interviewer [8] asked her if she experienced stage fright. The actress replied, "Yes. And it gets worse every year." Boris Karloff, the stage and screen character actor, answered the same interviewer, "I shudder and shake before every scene. After twenty-five years, too." Enrico Caruso admitted to being horribly frightened every time he performed in public. Yet these speakers continue to make public appearances, some even seeking out the occasion when the occasion fails to seek them. But if the would-be performer is still not satisfied, we can present several theories that might be helpful:

[8] J. Lane, "Take a Deep Breath," *Collier's,* Oct. 9, 1937.

1. Stage fright tends to disappear with repeated performances. Every teacher knows this. The first class meeting is a terrible ordeal, the second class less so, until finally meeting a class becomes routine and is taken in stride without any trace of fear, unless something unexpected occurs such as the entrance of a supervisor into the classroom. This suggested remedy for stage fright is much like the ordeal by fire except that the performer soon feels that there is really no fire, or if there is, he rather likes its warmth. Almost every professional performer who admits to having stage fright ends his admission with: "As soon as I step on the stage, however – " or, "Just as soon as I start to sing, then – " or "When once the camera begins to grind – ." From the moment he gets into action, fear is gone. The doing-of-something, that is the all-important factor. Psychologically, this method of overcoming stage fright is well-founded. We know that in the phenomenon of excitement, the sensation tends to disappear as soon as some overt response is made to the situation bringing about the excited state. The performance of the overt act is probably the first step in the reorganization of the individual's responses, leading ultimately to the establishment of behavior patterns more or less adequate for meeting the situation. When the situation is adequately met the emotional state (excitement) disappears.

2. The second suggestion is to think, if you can, only of what you have to say rather than of the people whom you are addressing or of yourself. If what you have to say is important enough to deserve audience attention, your audience will listen without your worrying about it. On the other hand, if you have no worth-while message you really have no business appearing before an audience. Moses was slow of speech – a stutterer, perhaps – until he received a message which he *had to communicate*. Then his speech be-

came potent. Complete preparation and faith in the preparation should do much to overcome fear of an audience. Once again, we emphasize that adequacy of response is the best way to overcome emotionality.

3. Speakers often overcome their fear of an audience by *shifting their attention* from the actual production of the speech to matters not directly connected with it. Walking on the stage, handling objects such as a book or a card, may be helpful. Unfortunately, such activities frequently distract the audience and so result in a futile performance. If the performer's movements are not distracting, and they can actually be made helpful in a speech situation as we indicated in the section on "Movement as a Factor in Attention" (page 227), there is no objection to the speaker's using them. Movement will relieve tensions in both the speaker and the audience. The removal of tensions should reduce emotional strain and with it the fear of the audience.

We realize that, even with the presentation of the three theories and their implied suggestions, we have not really presented a cure for stage fright. But we do not believe that at present (because of our very limited knowledge of the psychology of the phenomenon of stage fright) a positive cure can be presented. Some of the suggestions may be found helpful by some individuals and none found helpful by others. Indeed, it may be necessary for some people to consult a psychiatrist before any help can be had. In fact, if stage fright is a mental disturbance, the mere act of consultation with a reputable psychiatrist may be enough to bring about a definite cure. Many mental ills refuse to disappear under any other type of treatment.

BIBLIOGRAPHY

Allport, F. H., *Social Psychology.* Houghton Mifflin Company, Boston, 1924.

Bard, P., "A Diencephalic Mechanism for the Expression of Rage," *American Journal of Physiology,* LXXXIV (1928), 490–513.

Billings, M., "Duration of Attention," *Psychological Review,* XXI (1914), 121–135.

Blanton, M. G., "The Behavior of the Human Infant during the First Thirty Days of Life," *Psychological Review,* XXIV (1917), 456–483.

Blanton, M. G., and Blanton, S., *Speech Training for Children.* D. Appleton–Century Co., New York, 1924.

Bloch, O., "La Phrase dans le langage de l'enfant," *Journal de psychologie normal et pathologique,* 21st year (Jan. 15–Mar. 15, 1924), pp. 18–43.

Bloomfield, L., *Language.* Henry Holt and Co., New York, 1933.

Bode, B. H., *Conflicting Psychologies of Learning.* D. C. Heath and Co., Boston, 1929.

Buhler, K., *The Mental Development of the Child.* Harcourt Brace and Co., New York, 1933.

Cannon, W. B., and Britton, S. W., "Studies on the Conditions of Activity in Endocrine Glands," No. 20, *American Journal of Physiology,* LXXIX (1926–1927), 433–465.

Chapman, D. W., and Brown, H. E., "The Reciprocity between Clearness and Range of Attention," *Journal of General Psychology,* XIII (1935), 357–366.

Clark, H., "The Crowd," *Psychological Monographs,* XXI (1916), 26–36.

Clemens, S. L., *Adam's Diary.* Harper and Brothers, New York, 1904.

Coghill, G. E., *Anatomy and the Problem of Behavior.* Cambridge University Press, 1927.

De Laguna, G. A., *Speech, Its Function and Development.* Yale University Press, New Haven, 1927.

Dockeray, F. C., "Emotions as Disorganized Response," *Psychological Bulletin,* XXX (1933), 620.

Eisenson, J., "Confirmation and Information in Rewards

and Punishment," *Archives of Psychology,* 181 (1935).
Eisenson, J., "Some Characteristics of the Written Speech of Stutterers," I, *Journal of Genetic Psychology,* L (1937), 457–458.
Eisenson, J., and Pastel, E., "A Study of the Perseverating Tendency in Stutterers," *Quarterly Journal of Speech,* XXII (1936), 626–631.
Esper, E., "Language," in *Handbook of Social Psychology* (edited by C. A. Murchison). Clark University Press, Worcester, Mass., 1935.
Ewen, J. H., "Perseveration in the Insane Epileptics," *Journal of Mental Science,* LXXVI (1930), 537–540.
Froeschels, E., *Psychological Elements in Speech.* Expression Company, Boston, 1932.
Gesell, A., *Growth of the Pre-School Child.* The Macmillan Company, New York, 1926.
Goldstein, K., "The Problem of the Meaning of Words Based upon Observations of Aphasic Patients," *Journal of Psychology,* II (1937), 301–316.
Goodhue, M. L., *The Cure of Stage Fright.* The Four Seas Company, Boston, 1927.
Graff, W. L., *Language and Languages.* D. Appleton–Century Co., New York, 1932.
Gray, G. W., and Wise, C. M., *The Bases of Speech.* Harper and Brothers, New York, 1934.
Head, H., *Aphasia and Kindred Disorders of Speech.* Cambridge University Press, 1926.
Herrick, C. J., *Introduction to Neurology.* W. B. Saunders Company, Philadelphia, 1931.
Hildreth, G., "Mental Ability Measured by Verbal and Non-Verbal Tests," *Teachers College Record,* November 1932, 134–143.
Hollingworth, H. L., *Advertising and Selling.* D. Appleton Co., New York, 1913.
Hollingworth, H. L., *The Psychology of the Audience.* American Book Company, New York, 1935.
Husband, R. H., "A Study of the Emotions in Excitement," *Journal of General Psychology,* XLVI (1935), 465–470.
Jespersen, O., *Mankind, Nation, and Individual from a Lin-*

guistic Point of View. Harvard University Press, Cambridge, Mass., 1925.

Kretschmer, E., *Physique and Character* (translated by W. J. H. Sprott). Harcourt, Brace and Co., New York, 1925.

Kuntz, A., *A Textbook of Neuro-Anatomy.* Lea and Febiger, Philadelphia, 1931.

Langworthy, O., "Development of Behavior Patterns and Myelinization of the Nervous System in the Human Fetus and Infant," Carnegie Institute, Washington, Publication 443, *Contributions to Embryology,* XXIV (1933), pp. 3–57.

Lane, J., "Take a Deep Breath," *Collier's,* October 9, 1937.

Lewis, M. M., *Infant Speech.* Kegan Paul, Trench, Trubner and Company, London, 1936.

Lomas, C. W., "The Psychology of Stage Fright," *Quarterly Journal of Speech,* XXIII (1937), 35–44.

Martin, E. D., *The Behavior of Crowds.* W. W. Norton and Co., New York, 1922.

Max, L. W., "An Experimental Study of the Motor Theory of Consciousness," *Journal of Comparative Psychology,* XIX (1935), 469–486.

Max, L. W., "An Experimental Study of the Motor Theory of Consciousness, II," *Journal of General Psychology,* XIII (1935), 159–175.

McCarthy, D., *Language Development of the Pre-School Child.* University of Minnesota Press, 1930.

McDougall, W., *The Group Mind.* G. P. Putnam's Sons, New York, 1928.

Mead, C. D., "Age of Walking and Talking in Relation to General Intelligence," *Pedagogical Seminary,* XX, pp. 460–484.

Meltzer, H., "Talkativeness in Stuttering and Non-Stuttering Children," *Journal of Genetic Psychology,* XLVI (1935), 371–390.

Moore, H. T., "The Attention Value of Lecturing without Notes," *Journal of Educational Psychology,* X (1919), 467–469.

Murray, E., "A Study of the Factors Contributing to the Mal-Development of the Speech Personality," *Speech Monographs,* III, No. 1, 1936.

Murray, E., *The Speech Personality.* J. B. Lippincott Company, Philadelphia, 1937.

O'Neill, J. M., and Weaver, A. T., *The Elements of Speech.* Longmans, Green and Co., New York, rev. ed., 1933.

Orton, S. T., *Reading, Writing and Speech Problems in Children.* W. W. Norton and Co., New York, 1937.

Overstreet, H., *Influencing Human Behavior.* W. W. Norton and Co., New York, 1925.

Paget, R. A., *Human Speeech.* Harcourt, Brace and Co., New York, 1930.

Papez, J. W., *Comparative Neurology.* T. Y. Crowell Co., New York, 1929.

Piaget, J., *Language and Thought of the Child.* Harcourt, Brace and Co., New York, 1926.

Pillsbury, W. B., *Attention.* The Macmillan Company, New York, 1908.

Pinard, J. W., "Tests of Perseveration, II," *British Journal of Psychology,* XXIII (1932), 114–126.

Preyer, T. W., *Die Seele des Kindes.* Leipzig, 1912.

Ranson, S., *The Anatomy of the Nervous System.* W. B. Saunders Company, Philadelphia, 1934.

Riese, W., "Über einige motorische Herd-Symptome," *Psych. u. Med.,* 1927, 172–183.

Rivers, W. H. R., *Instinct and the Unconscious.* Cambridge University Press, 1920.

Rosanoff, A. J., *Manual of Psychiatry.* John Wiley and Sons, New York, sixth edition, 1927.

Sapir, E., *Language.* Harcourt, Brace and Co., New York, 1921.

Seth, G. S., and Guthrie, G., *Speech in Childhood.* Oxford University Press, 1935.

Sherrington, C. S. *The Integrative Action of the Nervous System.* Yale University Press, New Haven, 1906.

Spearman, C. E., *The Abilities of Man.* The Macmillan Company, New York, 1927.

Stern, C., and Stern, W., *Die Kindersprache.* Leipzig, 1907.

Sully, J., *Studies of Childhood.* Longmans, Green and Co., New York, 1895.

Thorndike, E. L., *Educational Psychology, Briefer Course.* Bureau of Publications, Teachers College, New York, 1927.

Thorndike, E. L., *Human Learning.* The Century Company, New York, 1931.

Thorndike, E. L., *The Fundamentals of Learning.* Bureau of Publications, Teachers College, New York, 1932.

Thorndike, E. L., *The Psychology of Wants, Interests, and Attitudes.* D. Appleton–Century Co., New York, 1935.

Thorndike, E. L., *Teachers Word Book of 20,000 Words.* Bureau of Publications, Teachers College, New York, 1932.

Travis, L. E., *Speech Pathology.* D. Appleton–Century Co., New York, 1931.

Weisenberg, T., and McBride, K. E., *Aphasia.* Commonwealth Fund, New York, 1935.

Wellman, B., *Speech Sounds in Young Children.* University of Iowa Studies in Child Welfare, V, No. 2, 1931.

West, R., *Purposive Speaking.* The Macmillan Company, New York, 1927.

West, R., Kennedy, L., and Carr, A., *Rehabilitation of Speech.* Harper and Brothers, New York, 1937.

Wheeler, R. H., *Science of Psychology.* T. Y. Crowell Co., New York, 1930.

White, W., "Language of Schizophrenia," *Archives of Neurology and Psychiatry,* XVI (1926), 16, 395.

White House Conference on Child Health and Protection, *Report of the Committee on Special Classes, Special Education.* D. Appleton–Century Co., New York, 1931.

Wolfe, T., *Look Homeward, Angel.* Charles Scribner's Sons, New York, 1929.

Woodworth, R. S., *Psychology.* Henry Holt and Co., New York, rev. ed. 1934.

Woolbert, C. H., "The Audience," *Psychological Monographs,* XXI (1916), 36–54.

Wundt, W., *Volkerpsychologie.* The Macmillan Company, New York, 1928.

Yerkes, R., *Almost Human.* The Century Company, New York, 1925.

Young, K., *Social Psychology.* F. S. Crofts and Co., New York, 1930.

Zipf, G. K., *Psycho-Biology of Language.* Houghton Mifflin Company, Boston, 1935.

INDEX

Abbreviation, 77, 84
Abbreviatory substitution, 85-6
Acetylcholine, 48
Adjectives, 128
Adrenal cortex, 52
Adrenal medulla, function and structure of, 49
Adrenalin, 49; and emotion, 49, 53
Adverbs, 128
Afferent nerve, 37
Allport, F. H., 195, 196, 197, 198, 199, 254
Ambiverts, 151
Amnesic type of aphasia, 184, 189
Animation and interest, 233, 236
Aphasia, 137, 138; and destruction of association areas, 45, 182; and echolalia, 181; and perseverating tendency, 180; classification of types of, 183-4; definition of, 137, 182; historical résumé of studies of, 182-3
Aphasic disorders, 179, 181; improvement of, 184-5
Aphasic, the, 179-90; heightened emotionality of, 181; personality of, 180; speech of, 180; speech and infant speech, 185-90
Apperception, 210
Apperceptive mass, 76, 91, 210
Articles, 128, 129, 130
Articulatory defects, 137
Assimilation, 138
Association areas, 43 ff.
Associative shifting, 68; and acquisition of meaning, 73, 79-80
Attention, 205, 210-32; and interest, 233; and perception, 220-1; and sense organ adjustment, 212, 213; bodily action in, 211, 212-14, 226; changing concepts in study of, 210-11; definition of, 211; duration of, 220; exploratory character of, 213; factors of advantage in, 214-18; in the speaker-audience relationship, 224-8; lapse of, 220; levels of, 211; learned factors of, 217-18; maintaining audience, 226; nature of stimulus in, 214-17; passive and active, 219; securing audience's, 224-5; selectivity of, 214; set in, 212, 213; span of, 221-3; spread of, in the audience, 229-32; the nature of, 210-11; voluntary and involuntary, 219
Attentive attitude, 212, 213
Attitude, personal, and word meaning, 78
Audience, the, 195, 197-8; and social facilitation, 196, 199; and the crowd, 195; influencing, 204
Audiences, types of, 204; casual, 205; concerted, 206; organized, 207; partly oriented, 205-6; selected, 206
Auditory area, 44
Autonomic nervous system, 34; and parasympathetic system, 34-5; and sympathetic system, 34-5; composition of, 34; neuro-anatomy of, 34; relationships with CNS, 34
Axons, 35

Babbling, 48, 117-19, 123; and congenitally deaf child, 119; definition of, 117; order of sounds in, 117-18; variety of sounds in, 117
Bard, P., 54
Bastian, 182

Behavior patterns, and reflexes, 46; development of, 46
Billings, M., 220
Blanton, M. G., 115
Blind, the, 158-64; defects in speech of, 136, 162-4; egocentricity of, 159, 163; intelligence of, 160; language development of, 161; physical development and health of, 158; sensory organization of, 159; social environment of, 159; verbal unreality of, 162; voice of, 162
Bloch, O., 127-8
Bloomfield, L., 18, 19, 87
Bode, B. H., 102, 105-6
Bodily build and personality, 146, 147
Broca, 181, 182
Broca's area, 43, 44; and speech, 43, 45-6

Cannon, W. B., 49; and Britton, S. W., 54
Central nervous system, 32 ff.
Cerebellum, functions of, 42; location of, 32
Cerebrospinal nerves, 32
Cerebrum, 32, 43; structure of, 32
Change of stimulus, and attention, 214, 225, 227; and movement, 215, 226
Chapman, D. W., and Brown, H. E., 223
Children's vocabularies, parts of speech in, 128 ff.
Cholé, 148
Clark, H., 230
Clearness and attention span, 223
Clemens, S., 15-16
Cluttering, 137
Coghill, G. E., 46
Common reference and word meaning, 75-6
Communication, 6
Concept(s), 89 ff.; definition of, 92; development of, in the child, 92-8; egocentric nature of child's concepts, 92-3; factors of advantage in formation of, 94-5; learning process in formation of, 98-9; nature and development of, 90 ff.; symbols and, 90
Concreteness and interest, 236, 239
Conflict and interest, 234-5, 238
Conjunctions, 128
Contamination, 139
Context and meaning, 76, 79
Conversation, 11; and thinking, 99
Co-ordinating centers, 40 ff.; and lower motor neurons, 41; cerebellum, 42; cerebrum, 43; cortex, 43; hypothalamus, 42; medulla, 41; striate bodies, 42; thalamus and, 42
Cortex, association and projection areas of, 43; auditory area, 43; Broca's area, 43, 45, 46; functional importance of, 45; localization of function in, 45; projection areas, 43; sensory areas, 43; visual area, 43
Cretin, speech of, 50
Crowd, the, 195 ff.; and the co-acting group, 195; behavior of, 198; conservative nature of, 202; emotional appeal to, 199; emotional reactions in, 195, 199; genesis of, 195-6
Cry (crying), birth, 114; colic, 115; differentiated, 116; hunger, 115; reflexive, 114; undifferentiated, 114
Cues, reduced, 72; symbolic, 73
Cycloid, the, 151

Deaf, the, and speech disorders, 136
Deaf-mutes, dreams of, 104-5; sign language of, 20; thinking, 104-5
Defects in speech (*see* Disorders in speech)
Definiteness of form, and attention, 217, 228

De Laguna, G. A., 23, 26
Dementia praecox (*see* Schizophrenia)
Dendrites, 35
Dental sound, 118
Depressive speech, 174-5
Dingdong Theory, 15
Divine Origin Theory, 13-14
Directing an audience, 207
Disorders in speech, 135-42; and intelligence, 135; and other disorders, 135-6; and personality, 136; and the physically defective, 135; functional, 136; incidence of, in children, 135; learning of, 139; of children, 135-42; organic, 136; types of, 136, 137
Drives, fundamental human, and interests and attitudes, 249-50
Dysphonia, 141-2

Echolalia, 48, 120, 123, 177, 190
Economic status, and language development, 131, 133
Efferent nerve, 37
Eisenson, J., 66, 167, 168, 169, 251
Emotion(s), 53 ff.; and glandular activity, 53; and language, 61; and rationalization, 258; and reorganization of behavior patterns, 55, 56-8; and speech, 55, 58; and stage fright, 264; and vocalization, 56; and voice, 10, 56; animal language, 5; crystallization of habit, 59; explanation of, 53 ff.; physiological picture of, 54; revelation of, 55-6
Emotional appeal, 199
Emotional behavior, and infant speech, 59; and primitive speech, 58
Emotional drives, 253, 255
Emotional intensity, and intellectual content, 60
Emotional responses, control of, 54
Endocrine glands, 48 ff.; and organic functioning, 48; and personality, 148; disturbances of, 148-9
Endocrine system, 48 ff.; composition of, 48-9; function of, 48; relationship to nervous system, 48
Engram, 79
Environmental adjustments, and personality, 149-50
Epileptics, 152
Epinephrin, 49
Esper, E., 117, 120
Ewen, J. H., 152
Expressive movements, 18; in infant speech, 117
Expressive type of aphasia, 184
Expressive-Receptive type of aphasia, 184
Extroversion, and introversion, 151
Extroversion, 151

Fairbanks, G., 165
First word, 121, 124; emotional character of, 124; sentence meaning of, 125
Free association, and autistic thinking, 107-9
Functional disorders of speech, 137

Gesture, signs, 20; social, 7; word, 114
Gesture Theory, 18 ff.
Glands, adrenal, 49; adrenal cortex, 52; pancreatic islands, 52; parathyroids, 49, 149; pineal, 52; pituitary, 51, 148; sex, 50; thymus, 52; thyroid, 148
Goldstein, K., 180
Goodenough Drawing Test, 131
Goodhue, M. L., 263
Graff, W. L., 79
Gray, G. W., and Wise, C. M., 75
Group, the, activity of, 196; and judgments, 196; and reasoning, 196; and speed of work, 196; characteristics of, 196-7; discussion, 205-6; mind, 204; relation-

Group, the (*continued*)
ships of, 200-4; responses of, 201, 204
Guttural sounds, 118

Hayes Revision of the Stanford-Binet, 160
Head, H., 183
Herbart, J. F., 210
Hildreth, G., 131
Hollingworth, H. L., 204, 205, 207, 230, 231, 253, 254, 255, 263
Homonyms, 77
Hormones, 48
Humor, 148
Husband, R. H., 261
Hypophysis, 51
Hypothalamus, and emotional behavior, 42; location of, 42

Ideas, innateness of, 210-11
Images, and imagination, 91-2; memory, 92
Impressing an audience, 206, 242-3; reading *vs.* speaking in, 244; repetition in, 246; the use of voice, 245; visual *vs.* oral presentation in, 243
Impressiveness, 241-7; of a stimulus, 241-2
Individuation and myelination, 47
Infant, breathing, 116; crying, 114-16; responses, 122-3
Intelligence, and language development, 130-1; and personality, 146, 147
Intensity of a stimulus, and attention, 215, 227; and change, 216, 227; primacy of, 241; repetition of, 241
Interest, 206, 233-40; and attention, 233; natural factors of, 233; in the speaker-audience relationship, 236-40
Interests and attitudes, 218, 251-2
Interjectional Theory, 17
Interjections, 128
Intonation, faulty, 140
Introversion, and extroversion, 151

Jackson, H., 183
Jespersen, O., 7

Kretschmer, E., 151
Kussmaul, 183

Lallation (lalling), 48, 70-1, 119, 120, 123, 137, 140
Lane, J., 265
Language, definition of, 3; development of, in the infant and child, 124-34; factors influencing development of, in child, 130-4; of lower animals, 5; primitive, 9; primitive, and sound duplication, 124; symbols of, 1
Laryngeal sounds, 21
Learning, and rewards, 64 ff.; basic principles in psychology of, 63 ff.; psychology of, applied to speech, in infants, 70-1; in primitive man, 69-70
Lomas, C. W., 53, 264
Lisping, 138, 140, 156; localization of function, 43-4

Manic, the, 151, 173; and flight of ideas, 107-8; symptoms of, 173; speech of, 173
Manic-depressive, the, 151, 172-5; speech of, 173; symptoms of, 173, 174
Metatheses, 139
Max, L. W., 104
McBride, K. E., and Weisenberg, T., 183, 184
McCarthy, D., 129, 130, 131, 133
Mead, C. D., 131, 132
Meaning(s), acquisition of, 73 ff.; and sense perception, 72; determinants of word meanings, 75 ff.; psychology of, 72 ff.
Medulla oblongata, 32, 41
Melancholé, 148

Meltzer, H., 167
Mental age, and vocabulary, 133
Moore, H. T., 244, 245
Motivation, 248-59; and fundamental human drives, 249-51; in the speaker-audience situation, 253-9
Motor nerves, 37
Müller, Max, 15
Murray, E., 145, 153-4, 262
Myelination, and behavior patterns, 47

Neologisms, 178, 180
Nerve, fibers, 35; impulse, distribution of, 38, 47; pathways, 35; tracts, 35
Nerves (*also see* Neurons), cranial; 34; peripheral, 34; spinal, 34; vagus, 34
Nervous mechanism of speech, 31 ff.
Nervous system, general topography of parts of, 32 ff.; neuro-anatomy of, 35 ff.
Neuron, axons, 35; connectors, 37; dendrites, 35; interconnections, 36 f.; lower motor, 41; motor or efferent, 37; myelination, 48; pathway, 37; sensory or efferent, 37; structure of, 35-6; synapse, 36
Neurons, types of, 36 ff.
Nouns, 128, 129

O'Neill, J. M., and Weaver, A. T., 211, 257
Onomatopoetic Theory, 16-17
Oral word, 10, 114
Organic changes, 156-7; and personality, 156
Organic disorders of speech, 137
Overstreet, H., 238

Paget, Sir R. A., 19, 20 ff., 22
Pancreatic islands, 52
Parathyroid gland, and emotional behavior, 49
Parathyroid glands, function of, 49
Pathological condition, effects of, on speech, 172, 190-1; effects of, on the individual, 155-6
Pathological speech, 155-7; characteristics of, 172-3
Perception, 91, 221, 222; factors that determine, 73 ff.; sense, 72; signs in, 72
Percepts, 18, 91
Perseveration (perseverating tendency), 152, 168, 177, 180, 190; and stuttering, 168-70
Personal attitude, and word meaning, 78-9
Personality, 145; and endocrine system, 148; and hormones, 148; and persuasion, 259; and speech, 153-5; body build and, 146, 147; definition of, 145; development of, 145-6; factors of, 146-50; intelligence and, 146, 147; temperament and, 146, 147; types, 150-3
Personality deviations, and speech, 158-91
Persuasion, 253; and the personality of the speaker, 259
Phlegm, 147
Physiogenic disorders of speech, 137
Physique, and personality, 151
Pillsbury, W. B., 211, 220
Pinard, J. W., 152
Pineal glands, 52
Pintner-Patterson Performance Scale, 131
Pituitary gland, and speech, 51; functions of, 51
Plato, 13, 15
Polarization, 198, 200, 203
Precurrent responses, 257
Prepositions, 128, 129, 130
Preyer, T. W., 127
Projection areas, 43-4
Prolactin, 51
Pronouns, 128, 130
Pronunciation, ease of, 82
Psychogenic changes, and organic changes, 156; and personality, 156; and speech, 156-7

Psychogenic disorders of speech, 137
Psychological crowd, creation of, 198; nature of, 200; relationships in a, 200-4
Psychopathic speech, 191
Punishment, in learning, 66
Pyknic, the, 151

Rationalization, 258
Reasoning, 107
Receptive type of aphasia, 184
Reduplication, sound, 124
Reference, community of, 75-6
Referent, and word meaning, 75
Reflex, scratch, 39
Reflex arcs, 37 ff.; and nerve impulse, 37-9; complexity of, 40; structure of, 37 f.
Reflexive vocalization, 27, 114, 153
Remembering, 105
Repetition, and attention, 216, 227; distribution of, 242; for gaining emphasis, 246, 256; frequency of, 242; successive, 242
Response, mass, 46; differentiation of, 46-7; differentiation of, in speech, 47-8; implicit, 102; vocal, 122
Responses, delayed, 256-7; empathetic, 229, 230, 232; immediate, 256-7; in conversation, 11; in thinking, 99-100; multiple, 83; pattern, 116, 117, 119, 121; precurrent, 257; set or attitude in determining, 63-4; specific, 4, 122; undifferentiated, 114
Reverie, and flight of ideas, 107; normal, 107-8
Rewards, effect of, in learning, 68; and defective speech, 140-1; and satisfyingness, 66; function of, in learning, 64 ff.; spread effect of, 65-8
Riese, W., 170
Rivers, W. H. R., 261
Rosanoff, A. J., 108

Sanguis, 147
Sapir, E., 89
Satisfyingness, 66
Schizoid, the, 151, 176
Schizophrenia, clinical forms of, 175; speech of, 176-9; symptoms of, 175-6
Schizophrenic, the, 175-9
Sensation, 91
Sense impressions, and attention, 210
Sensory areas, 43, 44; sensory clearness, 211; sensory nerves, 37
Sense-perception, 72
Sentence, and the word, 125; child's understanding of, 126-7; position of word in, 127-8; single word, 127; noun-verb, 127
Sex glands, and voice, 51; functions of, 50
Sign(s), in perception, 72; in language, 1, 9; speech, 1
Sign situations, 72-3
Similarity and interest, 235, 238
Similarity and novelty, 235, 238
Slang words, 61
Slurring, 140
Social Enterprise Theory, 25 f.
Social facilitation, 196, 199
Social pressure and thinking, 103, 109
Sound emergence, 117-18
Sound substitution, 137
Speaker, the, function of, 204; tasks of, 207-9
Speaker-audience relationships, 195-209
Spearman, C. E., 152
Speech, and co-ordination of activities, 26; and thought, 89 ff.; as stimulus-response situations, 17, 70; audible, 1, 10; comprehension of, 114; conventionalized reactions in, 122, 123; defects in (*see* Disorders in); definition of, 5; Dingdong Theory of, 15; disorders (*see* Disorders in Speech); Di-

vine Origin Theory of, 13-14; elements of, 9 ff., 89; evolution of, in infant and child, 113 ff.; functions of, 6 ff.; gesture, 9; Gesture Theory of, 18 f.; internalized, 101-2; Interjectional Theory of, 17; learning by infants, 113; localization of area for, 43, 44, 182-3; nervous mechanism of, 31 ff.; of the aphasic, 180 ff.; of the blind, 162-4; of the manic-depressive, 173; of the schizoid, 176-9; of the stutterer, 165 ff.; Onomatopoetic Theory of, 16-17; pathological, 155-7; personality, 153-5; situations, 11 ff.; Social Enterprise Theory of, 25 f.; stages in development, 114 ff.; sub-vocal, 102, 105; theories as to origin of, 13-27; Tongue Pantomime Theory of, 20 f.; visible, 1, 9
Speech defects of the blind (*see* Blind)
Spinal cord, 32; and brain stem, 32, 38-9; connection of, with brain, 33; structure of, 34
Spinal nerves, 34
Spread of attention, 229-32
Stage fright, 260-7; symptoms of, 260-1; the manifestation of an emotion, 264; theories of, 261-5; as a fear response, 261-2; as a learned form of behavior, 263; as a neurosis, 262; treatment of, 265-7
Stammering (*see* Stuttering)
Stanford-Binet Intelligence Test, 131
Stern, C. and W., 119, 129
Stimuli, defined, 63
Stimulus, adequate, 63; response unit, 63; social, 201
Striking quality, and attention, 216, 227
Stutterer, the, 165-72
Stuttering, 136, 137; definition of, 165; developed, 172; development of, in child, 170-2; frequency and distribution of, 165-6; initial, 171; perseveration in, 168-70; physiological symptoms of, 166; psychophysical symptoms of, 167; psychological characteristics of, 167; sound obstruction in, 165
Stuttering spasms, 170-1
Subcortical centers, 41 ff., 45
Substitution, abbreviatory, 84, 85; temporary abbreviatory, 86
Sub-vocal speech, 102, 105
Suggestion, the laws of, 254-5
Sully, J., 118, 124
Suspense and interest, 234, 238
Symbol(s), 4; and concepts, 90; gesture, 9; oral, 6, 10
Sympathin, 48
Synapse, 36; and conduction, 40; and stimulation, 40; nature of, 40; resistance of, 40; role in reflex arc, 40
Synthetic words, 22 f.

Temperament, and personality, 148; physiological basis of, 148
Thalamus, and striate bodies, 42; and behavior, 42; location of, 42
Thinking, and conversation, 99-101; and reasoning, 106-7; and remembering, 105-6; and speech, 89 ff., 103-5; and symbolization, 90; and words, 90; as abridged talking, 103-4; association of ideas in, 106-7; autistic, 107-9; directed, 107; implicit speech in, 101-2; materials used in, 89, 90, 105; rational, 106; responses in, 89, 100; stimuli in, 89, 100
Thorndike, E. L., 64, 241, 242, 248, 252
Thorndike Word Book, 83
Thought (*see* Thinking)
Thymus gland, 52
Thyroid gland, 50; and cretinism, 50; and speech, 50; function of, 50; results of disturbance in, 50

Thyroxin, 50
Titchener, 211
Tongue Pantomime Theory, 20 f.
Trappist monks, 19
Truncations, 84
Twain, Mark (Clemens, S.), 15-16

Undifferentiated cry, 114
Utterance, manner of, and word meaning, 78

Variety in attention, 214
Verbal context, 76
Verbal understanding, 120
Verbal utterance, 120, 121, 123
Verbalism, 162
Verbalization, 105
Verbs, 128, 129
Visual area, 43, 44
Vitalness and interest, 233-4, 237
Vocabularies, parts of speech in children's, 128-30
Vocabulary, children's, 128 ff.; comprehending, 122; speaking, 122
Vocal play, 117
Vocal response, 122
Voice, and emotional state, 10, 56; as emotional expression, 25; disorders of, 137; intensity, 225, 226; pitch, 225, 226; quality, 225, 226; use of, in impressing an audience, 245; time, 245

Weaver, A. T., and O'Neill, J. M., 211, 257
Weisenberg, T., and McBride, K. E., 183, 184
Wernicke, 183
West, R., 259
White House Conference Report, 135
White, W., 178
Winslow, C. W., 179
Wish, the, 257
Wolfe, T., 108
Woodworth, R. S., 72, 93-4, 99, 213, 217
Woolbert, C. H., 245
Word, first, 121, 124; magnitude, 77, 82 ff.; oral, 10; shortening, 86-7; signal function of, 4
Word salads, 177
Words, and concepts, 89; as symbolic cues, 73; categories, 128-30; choice of, 81 ff.; determinants of meanings of, 74 ff.; duplication of, 124; emotional content of, 124; factors determining choice of: ease of pronunciation, 82; magnitude, 82; single, 127; synthetic, 22
Wundt, W., 18, 211

Yerkes, R., 5
Young, K., 195

Zipf, G. K., 59, 84