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Aphasia in children: a review of literature and an annotated bibliography

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Thesis

Aphasia in Children: A Review of
Literature and an Annotated Bibliography

Submitted by

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CHAPTER I

THE PROBLEM AND DEFINITIONS OF TERMS USED

There has been an increasing interest in the disorder known as aphasia in children. Many children placed in institutions for the mentally retarded or in schools for the deaf have been found to have an aphasic disorder. Training methods that work with one child will not work with another who apparently has the same disability. In spite of the recognition of the symptom, some authorities dispute the existence of such a disorder. The literature is very scattered, occurring in journals of education, mental retardation, medicine, psychiatry, speech, and deafness over a span of years from about 1867 to 1960. Consequently, contradictions and confusions result in the description and the terminology. Over two dozen terms are used in the course of the description of the symptoms alone.

The Purpose. The purpose of this thesis is two-fold:

- 1) to survey the literature on childhood aphasia;
- 2) to compile an annotated bibliography on the subject.

Justification. Much has been written throughout the country on aphasia in general and on aphasia in adults in par-

ticular. Comparatively little has been written on aphasia in children, and the literature on this subject is very scattered. The American Speech and Hearing Association report on research needs states that relatively little seems to be known on aphasia in children and that much interdisciplinary research needs to be done to even agree on definition.¹ At a time when aphasia, or at least an aphasic-like symptom, is more and more recognized as an actual condition in children formerly diagnosed as deaf, mentally retarded, or emotionally disturbed, it seems fitting to attempt to draw together what is known about this controversial area.

Scope. All publications and articles on aphasia in children appearing in journals and magazines (as listed in bibliographies and other reference works) which were available have been read and included in an annotated bibliography. Works in foreign languages are not listed and have not been read. Unpublished theses and dissertations appear on the bibliography under "Other Sources" and have not been read. Other works, unavailable for one reason or another but known to the author, are listed in the bibliography under "Other Sources". A few works in the related areas of brain injury, mental illness, mental deficiency, and deafness have been

¹ Walter Amster, and others, "Report of Subcommittee on Problems of Aphasia," Journal of Speech and Hearing Disorders, Monograph Supplement 5:43, September, 1959.

read and annotated, as have works dealing primarily with aphasia in adults. The survey of the literature deals mainly with the most widely held beliefs and widely practiced methods on the nature, description, diagnosis, treatment, and prognosis of children suffering from this condition. Any person under sixteen years of age is considered a child.

Definitions of Terms. The following terms are briefly defined here as they are used in the thesis. No attempt has been made to define aphasia here, because the problem of definition alone comprises a good portion of the theoretical literature.

Agnosia -- "loss of the function of recognition of individual sensory stimuli; varieties correspond with the several senses."²

Agraphia -- "inability to express thoughts in writing due to a lesion in the central nervous system."³

Alexia -- "complete inability to read, characterized by an associative learning disability."⁴

Apraxia -- "loss of the ability to execute simple voluntary acts; especially loss of the ability to perform elementary units of action in the expression of language."⁵

² Kenneth S. Wood, "Terminology and Nomenclature," in Lee E. Travis, editor, Handbook of Speech Pathology, p. 49.

³ Ibid.

⁴ Ibid.

⁵ Ibid., p. 50.

Autism -- "absorption in phantasy to the exclusion of interest in external reality."⁶

Dysphasia -- "same as aphasia."⁷

Echolalia -- "automatic reiteration of words or phrases, usually those which have just been heard."⁸

Idioglossia -- "an individual language consisting of an extreme form of mispronounced and ill-expressed conventional language."⁹

Idiopathic -- "pertains to a pathological condition of spontaneous origin; that is, not the result of some other disorder or injury."¹⁰

Language -- the psychic process centered in the cortex which in its widest sense signifies the expression or communication of thoughts, feelings, and ideas.¹¹

6 Webster's New International Dictionary of the English Language, Vol. I. Second edition; Springfield, Massachusetts: G. and C. Merriam Company, Publishers, 1947. p. 186.

7 Wood, op. cit., p. 55.

8 Ibid.

9 C. Worster-Drought and I. M. Allen, "Congenital Auditory Imperception (Congenital Word-Deafness): And Its Relation to Idioglossia and Other Speech Defects," The Journal of Neurology and Psychopathology, 10:195, January, 1930.

10 Wood, op. cit., p. 57.

11 Isaac W. Karlin, "Aphasias in Children," A. M. A. Journal of Diseases of Children, 87:752, 1954.

Speech -- the symbolic expression and communication of language through words.¹²

Word-blindness -- same as alexia.¹³

Word-deafness -- "congenital verbal-auditory agnosia."¹⁴

¹² Ibid.

¹³ Webster's New International Dictionary of the English Language, Vol. I, op. cit., p. 63.

¹⁴ Isaac W. Karlin, "Congenital Verbal-Auditory Agnosia (Word-Deafness)," Pediatrics, 7:60, 1951.

CHAPTER II

A SURVEY OF THE LITERATURE

This chapter is an attempt to draw together the predominant trends of thought in the area of childhood aphasia. It is organized into the following areas: Definition, Neurology, Etiology, Incidence, Intelligence, Description of the Symptom Complex, Testing, Training, and Prognosis. In certain cases, conflicting points of view are presented, even though one may not be widely held, because the point of conflict may highlight the lack of clarity in definition or the need for more research in that area.

Definition

Congenital, or infantile, aphasia was first noted in 1867, but was not fully recognized until 1926 when Head published Aphasia and Kindred Disorders of Speech.¹ Aphasia in children is little understood. Most of the literature centers on a description of an existing symptom of which the etiology, pathology, and terminology are in dispute.

Literally, aphasia means the loss of the power of speech or the loss of language. Therefore, Freud (1897) has

¹ D. W. Van Gelder, L. Kennedy, and J. Laguaite, "Congenital and Infantile Aphasia: Review of Literature and Report of Case," Pediatrics, 9:48, January, 1952.

declared that true aphasia, whether of children or adults, involves a disruption of speech that has been already acquired.² Carrell and Bangs state that "the diagnosis of aphasia is by definition made only when language function is lost after having once been established."³ Adherents of this idea declare that such a condition as "congenital aphasia" is inaccurate, and another name should be found for the symptom. Suggested terminology includes: idiopathic language retardation, word deafness, congenital dumbness, idiopathic muteness, congenital auditory imperception, idiophasia, central deafness, and idiopathic audimutis.

Hoffman, however, calls aphasia a specialized linguistic loss, or disturbance of association, which includes all linguistic distortions, expressive or receptive, which are caused by a brain lesion. Linguistic distortions are not aphasia which are due to faulty muscular innervation or control, defective sense organs, or general mental deficiency.⁴ This would mean that language need not have been established before the brain lesion occurred.

Most writers, regardless of how they feel about the terminology itself, differentiate types of aphasia. Some dis-

² Eric Guttmann, "Aphasia in Children," Brain: A Journal of Neurology, 65:205, 1942.

³ James A. Carrell and Jack L. Bangs, "Disorders of Speech Comprehension Associated with Idiopathic Language Retardation," The Nervous Child, 9:72, January, 1951.

⁴ Jeanette A. Hoffman, "Training of Children with Aphasic Understanding," The Nervous Child, 9:85-86, January, 1951.

tinguish between acquired aphasia and congenital aphasia. The former refers to children who suffer partial or complete loss of speech or language already developed.⁵ The latter comprises those who suffer brain damage before the period when speech is normally established (about four years). Eisenson stretches this to include those children whose brain lesions were incurred soon after they began to use language, but before the habit of language usage (verbal symbol behavior) could become firmly established.⁶

Karlin suggests a classification, based on both symptomatic and etiological factors, to be used for diagnostic purposes. This would utilize the concept of "aphasias" rather than "aphasia." This classification is as follows:⁷

Acquired	Congenital
Acute, due to infections, convulsions, migraine	Speech aphasias
Subacute, due to tumor, abscess	Word deafness
Chronic, due to injury, hemorrhage	Dysphasia
	Visual aphasias
	Alexia (word blindness)
	Agraphia

Another distinction made is that between sensory and motor, or receptive and expressive, aphasia. These rarely exist in pure form, but are usually classified according to the predominant learning difficulties.⁸ Children with sensory

⁵ Carrell and Bangs, op. cit., p. 72.

⁶ Jon Eisenson, Examining for Aphasia, p. 20.

⁷ Isaac W. Karlin, "Aphasias in Children," A. M. A. Journal of Diseases of Children, 87:756, 1954.

⁸ Mildred A. McGinnis, Frank R. Kleffner, and Robert Goldstein, "Teaching Aphasic Children," The Volta Review, 58:239, June, 1956.

aphasia can hear, but lack the ability to understand speech. In extreme cases, even gross sounds and gestures may be meaningless. Those with motor aphasia possess an adequate understanding of speech but an inability to use expressive speech. There may, however, be considerable meaningless vocalization.⁹ In some cases, both receptive and expressive disturbance is severe and is called global, or mixed, aphasia.

Kastein distinguishes three classifications for aphasia: subcortical sensory aphasia, cortical sensory aphasia, and transcortical sensory aphasia. In subcortical sensory aphasia, there exists an ability to express sounds through speech, but an inability to perceive and repeat them. In cortical sensory aphasia, there is deficient perception and imitation of sounds with unimpaired spontaneous speech. Transcortical sensory aphasia involves an impairment of perception and imitation of sounds and of spontaneous speech.¹⁰ Evidently, she sees little chance for unimpaired perception.

For the purposes of this thesis, "aphasia" will refer to an impairment of language ability, congenital and acquired, sensory and motor, resulting from a disturbance of function of the central nervous system in certain areas of the brain dealing with speech and language. The battle over whether or not

9 Ibid., p. 240.

10 Shulamith Kastein, "The Different Groups of Disturbances of Understanding Language in Children," The Nervous Child, 9:33, January, 1951.

terminology permits a symptom known as "congenital aphasia" to exist will be left to others. "Acquired", "congenital", "sensory", "motor", and "global", will be used as descriptive terms, indicating the time of onset and the major area of difficulty.

Neurology

Aphasia results from a breakdown in the link between hearing and speech.

The link between hearing and speaking is language, the mind's use of various kinds of symbols....Through hearing, the child receives signals and learns to relate them to various events and meanings. What he perceives through audition becomes a part of him and, in terms of symbolic patterns, becomes a memory and a model. These models control the shifting patterns of his speaking; and in being able to hear his own speech and to compare it with what comes to him from outside, a feedback mechanism is set up. He learns to monitor himself.... Special attention must be centered on the children who, for one or more of several reasons, do not have the capacity naturally to develop this feedback mechanism.¹¹

The system of encoding and decoding messages consists of the conduction of sound, the reception of sound, transmission and dissemination of the encoded signals, perception, and association and interrelation.

We are concerned with a system designed to encode and decode messages. At various stages along this system, various break downs or misdirections can occur, and these can be described, in part at least, as knowable otological and neurological pathologies. These follow the structure of the system....Interference at the level of association and interrelation of the various elements of the sensory-motor cortex lies beyond the auditory system. Children with this difficulty may have only a sensory problem in that sound is meaningless to them in whole or in part; more particularly, speech

¹¹ William G. Hardy, "Problems of Audition, Perception and Understanding," The Volta Review, 58:289-290, September, 1956.

sounds, with their implications for language, are meaningless to them. Many of these children are obviously aware of and alert to sound, but do not readily learn the significance of the language sign. For many, this is true of visual as well as of audible cues. In others, the difficulty may center largely in the motor aspects of language....In others, it may be a combination of difficulties, transcortical in effect, and usually with behavioral overtones. These are not auditory, but language disorders, specific or general.¹²

The exact location and extent of the damage is still speculative, although certain areas and types of injury are quite definite.

Jellinek¹³ and Hart¹⁴ feel that even a moderate decrease in functional behavior in some parts of the brain is enough to cause impairment in receptive and expressive speech function. Nielsen claims that aphasia does not develop in children under five when only one side of the brain is damaged, because an entire cerebral hemisphere can be removed in a child and cause no aphasic disturbance.¹⁵ Karlin finds that aphasic arrest is found only in the dominant hemisphere of the brain. He assumes that after birth and until the end of the first year, the two hemispheres act together in all performances so that a functional differentiation between the two does not exist. Speech be-

¹² Ibid., pp. 293-294.

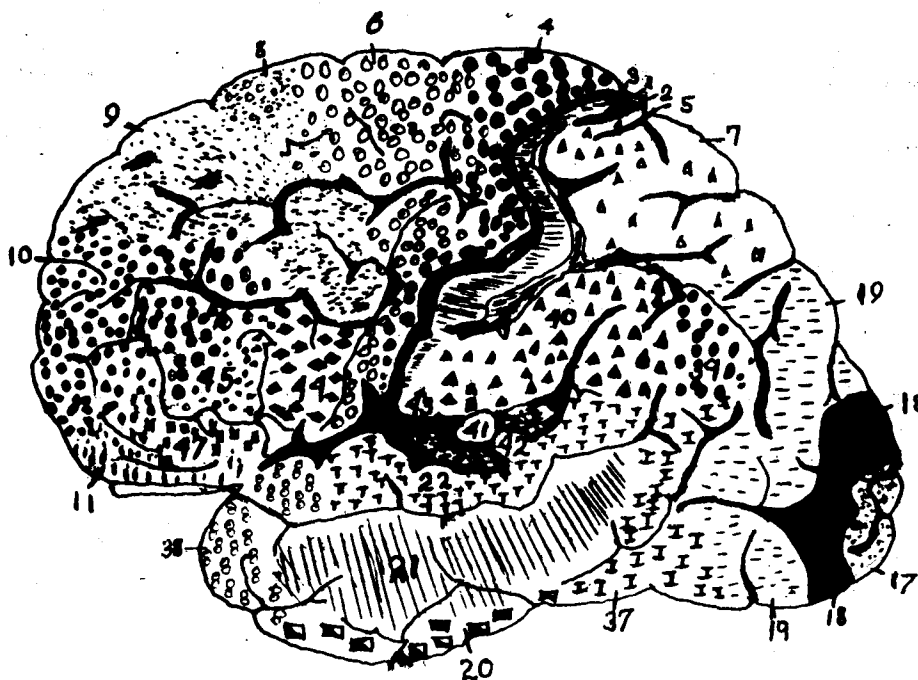
¹³ Augusta Jellinek, "Understanding of Speech," The Nervous Child, 9:17, January, 1951.

¹⁴ William H. Hart, "Childhood Aphasia," Clinical Proceedings of the Children's Hospital, Washington, D. C., 10:113, June, 1954.

¹⁵ Oscar Sugar, "Congenital Aphasia: An Anatomical and Physiological Approach," Journal of Speech and Hearing Disorders, 17:301, September, 1952.

FIGURE I

THE BRAIN AREAS



- Area 17 -- visual cortex
 Area 37 -- language formulation area
 Area 39 -- visual word area
 Area 41 -- auditory area in superior temporal gyrus; also occupies floor of Sylvian fissure and is surrounded by Area 42
 Area 42 -- psychoauditory zone
 Area 44 -- motor or expression area (Broca's)

16 Karlin, op. cit. (From Brodman, 1909), p. 754.

gins to emerge at a time when laterality becomes established and there is an interrelationship of development of the higher mental functions, cerebral dominance, handedness, and language function.¹⁷

The site or location of the involvement, rather than the pathological nature of the lesion, determines the symptom complex of aphasia.¹⁸ When lesions of the middle cerebral artery cause damage to the speech and language areas of the frontal, temporal, and parietal lobes of the brain, aphasia may result.¹⁹ Destruction of the visual association area leads to alexia. Brain lesions of the posterior cortex disturb comprehension of speech more than expression, while brain lesions of the anterior cortex disturb expression more than comprehension.²⁰ Penfield and Roberts find that particular deficits in language follow specific cortical removals. The areas for speech, in the order of their importance, are: the posterior temporo-parietal (indispensible for normal speech), Broca's (can be sacrificed), and the supplementary motor areas (removal causes aphasia that disappears in a few weeks). However, it seems likely that a sub-cortical center plays a most important role in the total mechanism and employs all three cortical speech areas.²¹ Although

17 Ibid., pp. 753-756.

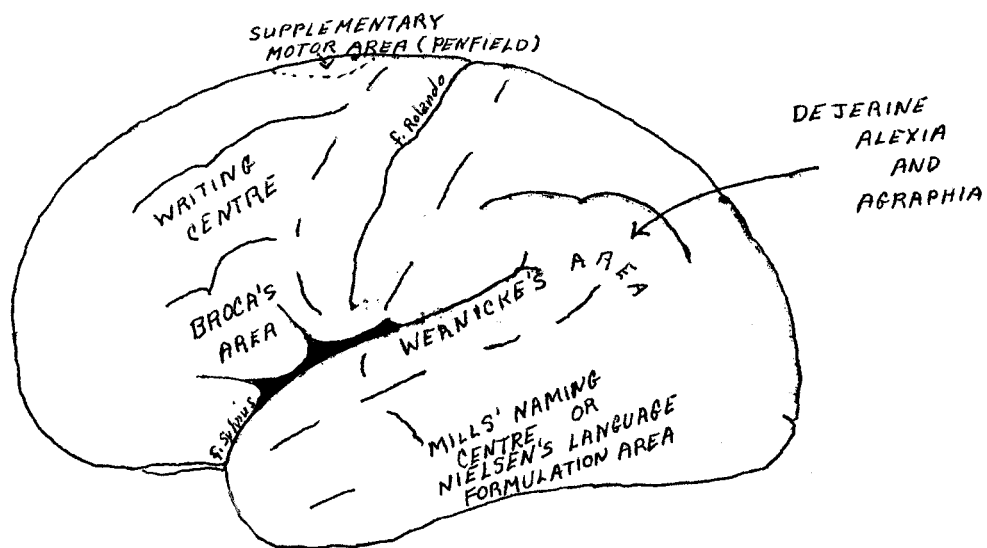
18 Ibid., p. 756.

19 Sugar, op. cit., p. 301.

20 Hart, op. cit., p. 113.

21 Wilder Penfield and Lamar Roberts, Speech and Brain Mechanisms, pp. 190-205.

FIGURE II
 SPEECH AREAS
 FROM THE LITERATURE



Summary of some of the important areas for speech as described in the literature. Not all of them have been mentioned in this thesis, but they may be found in sources cited.

22 Adapted from Penfield and Roberts, Ibid., p. 80.

there is no specific localization for agnosia and apraxia (Penfield and Roberts), the nearer the lesion is to the junction of the parietal, temporal, occipital lobes, the more reading and writing are affected; the more the posterior superior temporal region is involved, the more comprehension of spoken words is affected; and the closer the lesion to Broca's area and the adjacent precentral face area, the more the components of speech are involved. They do not feel that a bi-lateral representation of speech is probable, but it is a possibility.²³

Since disturbances in one part of the brain tend to have some effect on other parts of the brain, often both functions are affected even when the major damage occurs only to one. The dysfunction is a central one, and may be cortical or subcortical, with motor or pyramidal tract involvement. Many feel that the defect is in the audito-psychic area or Wernicke's area.²⁴

It has not been definitely demonstrated that the right hemisphere is dominant for left-handers in the same way that the left one is for right-handers. Sometimes all of speech is represented on the right in right-handers, but aphasia is quite rare with involvement of only the right hemisphere. The left hemisphere is usually dominant for speech, regardless of handedness. When a lesion occurs which is large enough to cause

²³ Ibid., pp. 72-87.

²⁴ Isaac W. Karlin, "Congenital Verbal-Auditory Agnosia (Word-Deafness)," Pediatrics, 7:63-68, 1951.

transfer of dominance, that transfer includes all the components of speech.²⁵

Because recovery of speech occurs following damage of part of the left hemisphere, it does not indicate that the right hemisphere usually takes over the function of the homologous area on the left. Aphasia usually occurs after a second injury to the left half. It seems that if other areas on the left are capable of functioning during speech, they will. After complete removal of the left hemisphere, then the right half is used. If this occurs early in life, speech develops or returns much more readily than if it occurs in adulthood.²⁶

Etiology

Aphasia may have one of several causes. In acquired aphasia, the aphasia is secondary to some definite pathology in the brain, such as infection, tumor, or cerebral vascular accident. These cases show laboratory evidence of brain pathology. The congenital aphasic shows a failure in the development of language without any history or neurological signs of brain injury or disease.²⁷

Most cerebral disorders may result from encephalitis, burns, head injuries, brain tumors, cerebral anoxia, and allergy.²⁸ These may therefore cause aphasia. Aphasia is found in children with cerebral palsy whose conditions frequently include neuromuscular dysfunctions and specific articulatory defects; in

25 Penfield and Roberts, op. cit., pp. 90-102.

26 Ibid., p. 102.

27 Karlin, "Aphasias in Children," op. cit., p. 756.

28 Harry Bakwin, "Cerebral Damage and Behavior Disorders in Children," Journal of Pediatrics, 34:371, March, 1949.

children with tonic diseases involving the brain cortex, such as encephalitis with measles, whooping cough, and influenza; and in children with malformations of the skull. Aphasia may also result from falls or accidents which involve head injuries.²⁹ There are some who feel that aphasia may result from a severe emotional disturbance,³⁰ but this is generally discredited. There were no pertinent autopsy findings as of January, 1951.³¹

Incidence

There is great variance in the literature as to the incidence of aphasia in children. Guttmann feels that although there are not many cases of infantile aphasia on record, aphasia resulting from left hemisphere lesions in childhood is not rare.³² Nadoleczny (1926) found aphasia in children as a result of head injury rare.³³ Worster-Drought and Allen in 1930 reported that there were only fifty cases in the literature over the previous sixty years. This would make it much more uncommon than congenital word-blindness. They suggest some reasons for its rarity:

1) The symptomatology is not as obvious as that of other disturbances such as word-blindness. The incidence may there-

29 Eisenson, op. cit., p. 20.

30 Carrell and Bangs, op. cit., p. 69.

31 Ibid.

32 Guttmann, op. cit., pp. 206-207.

33 Ibid., p. 205.

fore actually be much greater.

2) Without a suitable environment, aphasic children are likely to become "imbeciles from deprivation."

3) From 1889 on, many cases were described under idiosglossia, which is probably the speech complication of congenital aphasia.

4) Psychological and behavioral problems tend to arise as a result of mishandling, and erroneous diagnosis may result.³⁴ No one is convinced of the accuracy of this representation of the incidence.

Aphasia is much more common in males than in females, in a ratio of about five to one.³⁵

Intelligence

Van Gelder, Kennedy, and Laguaite feel that the aphasic child may have any degree of intellectual potential,³⁶ but most of the authorities feel that aphasia, especially congenital, should refer to a speech symptom in children who are intellectually and physically capable of speech. Otherwise, it would become so intertwined with other types of brain injury and mental deficiency that it would be virtually impossible to

³⁴ C. Worster-Drought and I. M. Allen, "Congenital Auditory Imperception (Congenital Word-Deafness): And Its Relation to Idiosglossia and Other Speech Defects," The Journal of Neurology and Psychopathology, 10:205-208, January, 1930.

³⁵ Ibid., p. 208.

³⁶ Van Gelder, Kennedy, and Laguaite, op. cit., p. 49.

differentiate the pathogenesis responsible for the speech symptom.³⁷

Worster-Drought and Allen point out that the aphasic child may become an imbecile from deprivation if there is a poor environment and no attention given to the disability. In some cases, poor environment may lead to antisocial tendencies and delinquencies.³⁸

Description of the Symptom Complex

The description of symptoms found in the literature is so diverse, that at times it is difficult to believe that the authors are describing the same disorder. Therefore, this section mentions only those which occur most consistently.

Perceptual Symptoms

There is usually evidence of perceptive difficulty in the preschool years, especially in the area of the association of symbols with concrete objects. Most children can perceive sound well, but cannot interpret what they hear. They cannot naturally listen, understand, store, or recall symbolic structures involving a time order and a stress pattern. They may not be able to naturally lipread or do well in gestural or manual language,³⁹ or they may lipread and understand gestures

37 Sugar, op. cit., pp. 303-304.

38 Worster-Drought and Allen, op. cit., p. 227.

39 Hardy, op. cit., p. 299.

well.⁴⁰ Some children with sensory aphasia show little response to noises and sounds and show an almost total lack of auditory attention, while their visual attention is acute and visual stimulation an obvious source of pleasure.⁴¹ The essential feature is that spoken language is not understood when spoken in the patient's hearing but out of sight.⁴² Sometimes musical sounds, or even cruder sounds, are not understood or appreciated, and sometimes this perception may be normal.⁴³ The sensory aphasic cannot give his attention to just one sound, and therefore at times he seems not to hear.⁴⁴ The child may occasionally respond to sounds, especially brief ones, for a short time.⁴⁵

Some children with congenital motor aphasia do not show the auditory inattention characteristic of the child with sensory aphasia.⁴⁶

Motor aphasics seem to have adequate understanding of

⁴⁰ Karlin, "Aphasias in Children," op. cit., p. 763.

⁴¹ Kastein, op. cit., p. 33

⁴² Worster-Drought and Allen, op. cit., p. 213.

⁴³ Ibid., p. 215.

⁴⁴ Helmer R. Myklebust, "Training Aphasic Children," The Volta Review, 57:153, April, 1955.

⁴⁵ Louis Kleinfeld, "Otologic Aspects of Speech Comprehension," The Nervous Child, 9:45, January, 1951.

⁴⁶ Karlin, "Aphasias in Children," op. cit., p. 761.

speech for their age group. Sensory aphasics show a discrepancy between their ability to hear and their ability to understand spoken language. Therefore, evaluations cannot always be done by conventional procedures.⁴⁷

There is present an impairment in concept formation. This is caused by the underlying pathological disturbance rather than a primary impairment of conceptual thinking.⁴⁸ There may be a disturbance of spatial relationships.⁴⁹

Verbal Symptoms

In congenital aphasia, the most pronounced symptom is delayed speech. There is a general inability to communicate normally through speech, characterized mainly by inadequate comprehension of spoken language, failure to talk, and little speech or jargon.⁵⁰ In sensory aphasia, there is both a lack of understanding of speech and a lack of expressive speech. Consequently, there is little or no vocalization, jabber, or chatter with inflection, facial expression, or gesture. There may be echolalia or an appropriate use of a limited number of words or phrases with understanding limited to

47 McGinnis, Kleffner, and Goldstein, op. cit., p. 240.

48 Sidney W. Bijou and Heinz Werner, "Language Analysis in Brain-Injured and Non-Brain-Injured Mentally Deficient Children," The Journal of Genetic Psychology, 66:253, June, 1954.

49 Carrell and Bangs, op. cit., pp. 68-69.

50 Ibid.

these. However, the child may not recognize them when they are spoken.⁵¹ The child with sensory aphasia is more affected and disturbed than the child with motor aphasia, for he is disturbed in all types of language. When he cannot understand speech, he cannot learn to use it.⁵² In the child of three or four, there may be no speech. The child of six may have limited or distorted speech.⁵³ In some cases, the child can repeat sounds and words he hears, but he cannot repeat a long series of words.⁵⁴ There is a lack of abstract thinking, an irrelevancy of ideas, and a tendency to perseverate.⁵⁵ When lipreading has been learned, the child may be able to understand language easily by sight. There may be some difficulty in appreciating the meaning of written and printed symbols. When the child attempts to write, he shows certain errors which correspond to the errors found in oral speech. Writing from dictation is impossible when the speaker is out of the patient's sight.⁵⁶

51 McGinnis, Kleffner, and Goldstein, op. cit., p. 240.

52 Myklebust, op. cit., p. 152.

53 Karlin, "Aphasias in Children," op. cit., p. 758.

54 Worster-Drought and Allen, op. cit., p. 214.

55 Isaac W. Karlin and Millicent Strazzula, "Speech and Language Problems of Mentally Deficient Children," The Journal of Speech and Hearing Disorders, 17:291, September, 1952.

56 Worster-Drought and Allen, op. cit., pp. 216-218.

In motor aphasia, the child does not speak at all, or makes only primitive sounds. There may be some improvement as he grows older, even without special education.⁵⁷ There may, however, be considerable vocalization. The pattern of vocalization shows sounds repeated over and over, with facial expression, voice quality, and inflection usually varying appropriately with the meaning of the content. There is use of gesture, and a partial or complete inability to imitate actions or positions of the tongue, lip, and jaw, or to imitate sounds and words. However, there is adequate control of the muscles used in speech or in other acts such as chewing or swallowing.⁵⁸ When a word is gotten out, it is usually well-articulated. The child often cannot say words until after three or four years of age. With good training, there may be considerable speech by five or six. A moment after speaking a word, he cannot repeat it. This is determined by his activities, interest, and nervous system.⁵⁹

In acquired aphasia, one never sees a loss of individual parts of speech, but a depression or reduction of the entire speech function.⁶⁰ All children under ten, wherever the

57 Karlin, "Aphasias in Children," op. cit., pp. 761-763.

58 McGinnis, Kleffner, and Goldstein, op. cit., p. 240.

59 Myklebust, op. cit., p. 151.

60 Hart, op. cit., pp. 113-114.

lesion, tend to show a reduction of spontaneous speech. When the child is over ten years, there is not always reduction of speech output, and there may even be a hypo-spontaneity of speech. Often these children produce the picture seen in adults.⁶¹

Behavioral Symptoms and Psychological Problems.

Whatever the type of aphasia, there are certain psychological problems which may be seen: 1) difficulties in patterned behavior in motor, perceptual, emotional, and social areas, with tendencies toward regressed or retarded maturation; 2) a severe, poorly patterned anxiety; and 3) a greatly increased need for human support in all of his areas of adjustment.⁶² Some children are contented, show an apathetic disregard of their handicap and its results, and are apparently happy in their condition. Others develop a mild paranoid reaction, feel the situation keenly and develop a sense of inferiority and behavior disorders, or demonstrate an emotional blocking of output when anything is demanded of them. Such misbehavior is not caused by the defect itself, but is a consequence of the child's relationship to his environment.⁶³

61 Guttman, op. cit., p. 209.

62 Laretta Bender, "Psychological Problems of Children with Organic Brain Disease," American Journal of Orthopsychiatry, 19:405, July, 1949.

63 Worster-Drought and Allen, op. cit., p. 228.

The child may be ill-tempered, mischievous, spiteful, destructive, nervous, and show a tendency to give up easily. He may have a poor attention span and show a tendency toward solitary play,⁶⁴ shyness, social withdrawal, and seclusiveness.⁶⁵ He reacts fairly normally to behavior he can understand. He may show aggressiveness and irritation without there seeming to be a normal provocation.⁶⁶

The child with sensory aphasia is easily distracted and gives his attention to anything that is before him, whether or not it is important to him at the time. He may be very active and grab things. He cannot separate the important from the unimportant, and he cannot control himself, because he cannot grasp the true meaning of his surroundings and his experiences. However, once he has embarked upon an activity, he has trouble stopping it. He may giggle and laugh compulsively. He cannot wait, because he cannot tolerate having things on his mind and waiting until a logical time to go ahead with them. He is not shy, and makes little distinction between friends and strangers. Development of control of toilet habits is slow, and confusion, misunderstanding, and bewilderment are common.⁶⁷

64 Carrell and Bangs, op. cit., pp. 68-69.

65 Karlin, "Aphasias in Children," op. cit., p. 758.

66 Ibid., p. 762.

67 Myklebust, op. cit., pp. 152-153.

It is apparent that aphasic children may exhibit any number of behavioral characteristics, and therefore behavior cannot be used alone as a diagnostic key. In many cases, the child exhibits characteristics of several disorders.⁶⁸

Physical and Motor Symptoms.

The literature presents a conflicting picture with respect to motor control. Carrell and Bangs describe a general lack of muscular control in games and in handwork;⁶⁹ Myklebust says that the child is awkward and clumsy in walking or in using his hands;⁷⁰ and Van Gelder, Kennedy, and Laguaite speak of incoordination, not only of the speech organs, but of other muscular systems as well.⁷¹ However, McGinnis, Kleffner, and Goldstein state that there is adequate control of the muscles used in speech and in other acts such as chewing or swallowing,⁷² and Karlin states that the child is usually skillful in his movements.⁷³ Carrell and Bangs also find an unusual amount of physical activity, and a prominence of left-handedness.⁷⁴

68 Hollie E. McHugh and R. Hall McCoy, "The Evaluation of Hearing in Pre-School Children Who Lack Normal Speech. A Preliminary Report," The Laryngoscope, 64:849, October, 1954.

69 Carrell and Bangs, op. cit., pp. 68-69.

70 Myklebust, op. cit., p. 153.

71 Van Gelder, Kennedy, and Laguaite, op. cit., p. 49.

72 McGinnis, Kleffner, and Goldstein, op. cit., p. 240.

73 Karlin, "Aphasias in Children," op. cit., p. 762.

74 Carrell and Bangs, op. cit., pp. 68-69.

Testing

Any testing program must be many-sided and include intelligence tests, hearing tests, neurological tests, psychological tests, and physical examinations, as well as detailed case histories. The tester must be very experienced in differential diagnosis so that subtle distinctions of the several possible disorders may be ascertained.

Tests.

Intelligence cannot be judged from a test which involves the understanding and appreciation of oral instructions.⁷⁵ Instructions should be given in simple pantomime, and there should be no penalty or bonus for performance speed. Only those situations to which a handicapped child can adjust as well as a normal child, and in which no verbal responses are required, should be included.⁷⁶

Tests should be used which employ form boards, objects for sorting, colored blocks, and pictures, all of which are on a perceptual and adaptive level of behavior. They should involve perception and imitation of an action or series of actions. Suggested general tests are: Blum, Burgemeister, and Lorge, The Mental Maturity Scale for the Motor Handicapped, and the Columbia Mental Maturity Scale by the same authors.

75 Worster-Drought and Allen, op. cit., p. 230.

76 Eisenson, op. cit., p. 20.

The following tests may be used with some adaptations: the Pintner-Patterson Performance Test Series, the Arthur Point Scale of Performance Tests, the Porters Maze Test, and the Leitner International Performance Scale.⁷⁷

The Gesell Formboard and the Seguin Form Board are useful, not for intelligence testing, but merely to see if the child perceives the relationship between the holes and the inserts. At one year of age, the child should be able to insert the circle correctly, and by two years, the triangle and the square.⁷⁸

At eighteen months, a child should, unless he has cerebral palsy, be able to build a three-block tower. By two years, he should be able to build a four-block tower out of one-inch cubes.⁷⁹

The child should be able to do object sorting. The simplest is to distinguish between two groups of objects that are identical except for one aspect, such as color. He should be shown what to do. If he fails, he should be helped once or twice to imitate. At three-and-a-half years, he should be able to succeed at a button sorting test (Form M of Terman and Merrill's revision of the Stanford-Binet). Verbal directions

77 Ibid., p. 21.

78 Ibid., pp. 21-22.

79 Ibid., p. 22.

are used, and a two-minute time limit given. There are twenty buttons, ten black and ten white. Gestures will be necessary if the child is congenitally aphasic.⁸⁰

The last group of tests mentioned by Eisenson utilize jigsaw puzzles. The picture must be within the child's direct experience and be simple and obvious; the puzzle should have no more than six pieces. First it is demonstrated, and the child is then given several trials. A variation of this is the Mare and Foal Board, which is a subtest of the Pintner-Patterson Scale.⁸¹

Many test results must be judged subjectively, such as the observations of vocalizations and the interpretations of responses in relation to behavior observed during hearing tests. Head phones are not used in the objective hearing test, and therefore the free, or sound, method is utilized.⁸² Hearing testing should also include a Galvanic Skin Response test.⁸³

The Electroencephalogram should be an integral part of the neurological and physical examination, even though it is often of little use when dealing with cerebral disorders.⁸⁴

80 Ibid.

81 Ibid., p. 23.

82 McHugh and McCoy, op. cit., pp. 855-857.

83 Bakwin, op. cit., p. 380.

84 Ibid.

These tests should form a pattern which points to aphasia. No one test can be considered conclusive. Many children come for confirmation of deafness, mental retardation, emotional disturbance, or visual difficulties. Others because of incoordination or inattention are seeking help. The hearing test must rule out deafness as the source of the auditory difficulties; the intelligence test, the ruling out of mental deficiency; and the psychological, the ruling out of emotional disturbance as a primary difficulty. Agnosia is tested by all of the above plus tests of tactile perception. The less verbalization is involved in questions or in responses, the more accurate or valid the results of the tests will tend to be.

Differential Diagnosis.

Karlin has suggested certain points of discrimination between mental retardation, schizophrenia, autism, and aphasia. His categories and their components will be briefly enumerated.

Mental Retardation. Developmentally, there is a delay in the onset of sitting, walking, and talking. Behaviorally, the child shows little interest in his surroundings, becomes easily tired, has slow and awkward movements, and seems placid or erethic. He may behave like a psychotic. On intelligence tests, he shows an all-pervasive deficiency, although there may be an uneven distribution of abilities. His speech is meager, limited to a few irrelevant words, shows a marked tendency toward echolalia, and demonstrates a scanty

vocabulary and a meagerness of ideas. He will improve with age, but there will not be much change; he generally remains on the same level.

Schizophrenia. Developmentally, the onset of sitting and walking is normal. However, the child's behavior is odd and bizarre. He may be seclusive, and show immobility and posturing. He does not pay attention to his surroundings, and his mode of thinking and acting is foreign to normal life. There is general emotional blunting, or else emotional response out of proportion to the external situation. On the intelligence test battery, he may be extremely backward in certain tests and surpass his own age level in others. He may even be confused with children having superior intelligence. His speech may be very limited, sparse, incoherent, or irrelevant; he may use made-up words or odd combinations of actual words. Regression in behavior and interests becomes more marked with age.

Autism. Withdrawal tendencies are noted early. The child shows an obsessive desire for the maintenance of sameness. Changes in routine can drive him to despair. He usually shows good relationships to objects, is interested in them, and plays with them, but he does not pay attention to persons or to what people do around him. The child may remain mute, but most acquire the ability to speak. However, the speech does not convey meaning to others. Naming is easy; the child may remember long and unusual names. Delayed echo-

lalia may be present, where a child repeats at a later date a word or sentence he heard a day or two before. Not much change or progress is seen.

Aphasia. Developmentally, the onset of sitting and walking is normal, but the onset of speech is late. Behavioristically, the child shows a tendency to shyness and seclusiveness. He reacts fairly normally to stimuli in surroundings he can understand. Due to lack of verbal understanding, he may at times show aggressiveness and irritation. Intelligence tests show a scattered picture: backward in verbal tests, normal in performance tests, and skillful in his movements. Speech may be absent; the child may lipread or understand gestures. Some improvement is seen as he grows older.⁸⁵

As may be seen, the characteristics of each category, or disorder, overlap. No one but a skilled observer and clinician can accurately weed out aphasia as distinct from any of the others.

Training

There are many theories of the best way to teach the aphasic child, although most of them are more similar than they are different. Carrell and Bangs feel that the initial efforts of therapy should be primarily directed toward the socialization of the child in a situation where no direct

⁸⁵ Karlin, "Aphasias in Children," op. cit., p. 763.

pressure is placed upon the child to talk. They therefore feel that group therapy is the most desirable. They recommend that two children be included in the group who have considerable language, so that there may be much language stimulation without placing communication pressure on the child. Activities should involve large muscle action. The undesirable behavior of the child should be made much less rewarding. The principle speech work would be on vocabulary, with only incidental work on pronunciation.⁸⁶

Many authorities would agree with the sequence of therapy, but disagree on group therapy, feeling that it places too many demands on the child. Some feel that the child must be educated as deaf,⁸⁷ while others feel that the child will not learn from many deaf procedures.⁸⁸

Hardy advocates diagnostic teaching, wherein various ideas and situations are treated in a consistent effort to assess the relationships between capacity and achievement. So many children have a wide variety of potentials in different areas that it is necessary to consider the training program of each child separately.⁸⁹

86 Carrell and Bangs, op. cit., pp. 73-74.

87 Kleinfeld, op. cit., p. 47.

88 Hardy, op. cit., p. 299.

89 Ibid., pp. 300 and 309.

While it is true that many cases of acquired aphasia can improve without special education, usually the only way in which a child may obtain an understanding of speech symbols is to have a course of intensive training.⁹⁰ There must be an integration of speech and language with academic subjects, particularly with older children.⁹¹ Therapy usually produces the best results when it utilizes visual, auditory, and tactile clues simultaneously.⁹² However, there are some children who seem to respond better to syllable type therapy.⁹³

Generally, education through the auditory route is not possible, and by the visual route, difficult. Certain goals must be kept foremost: 1) to secure a normal relationship with those with whom the child comes in contact; 2) to provide a means of communication with, and understanding of, his fellows; and 3) to enable him to qualify for some occupation in which he can engage in a manner in line with his abilities.⁹⁴

Karlin suggests some general principles of treatment and rehabilitation, to be used primarily with congenital aphasics:

90 Kastein, op. cit., p. 47.

91 McGinnis, Kleffner, and Goldstein, op. cit., p. 241.

92 Van Gelder, Kennedy, and Laguaite, op. cit., p. 53.

93 George W. Gens and M. Lois Bibey, "Congenital Aphasia: A Case Report," Journal of Speech and Hearing Disorders, 17:36, March, 1952.

94 Worster-Drought and Allen, op. cit., pp. 230-231.

1) The principle of facilitation -- the stimulation of one neuron or an area of neurons may facilitate another area through subliminal stimulation. Stimulation of one performance field may influence the performance of other parts of the same field.

2) Because there is a reduced receptivity, it takes longer for the child to react. Therefore, the child may succeed when given a sufficiently long exposure to the stimulus, but fail when a brief exposure is given.

3) Distracting stimuli must be reduced to a minimum.

4) Parents must be included in the treatment program. They need to understand the defect and to realize that a long period of observation is necessary. They need to realize that the normal process of growth may produce results no one can foretell. The parents should receive education on the normal growth and development of the child.

5) Emphasis in training on the use of unimpaired or relatively unimpaired sensory and motor pathways, as well as on the establishment of new pathways.⁹⁵

Karlin, too, feels that initial efforts should be on socialization, preferably in a nursery or kindergarten with normally speaking children. The speech sessions should be fun and contribute to the child's regular life activities.

⁹⁵ Karlin, "Aphasias in Children," op. cit., pp. 764-765.

Work should be on the building up of speech patterns, not sound by sound or word by word. Frustration should be avoided.⁹⁶

Myklebust believes that expressive language must follow, not precede, receptive language,⁹⁷ while McGinnis, Kleffner, and Goldstein, using the "Association Method," feel that expression is the foundation or starting point in building language.⁹⁸

The principles of the "Association Method," as given by McGinnis, Kleffner, and Goldstein, are as follows:

- 1) A phonetic or elemental approach to learning words.
- 2) Emphasis on precise articulatory position for each sound. Smooth articulation is not encouraged until it can be accurate.
- 3) A careful association of each articulatory position and sound with the appropriate letter-symbol(s) of cursive script.
- 4) Use of expression as the foundation or starting point in the building of language.
- 5) Systematic sensory-motor association.⁹⁹

Mykelbust gives some other principles of teaching, some

96 Ibid., p. 765.

97 Helmer R. Myklebust, "Language Training: A Comparison Between Children with Aphasia and Those with Deafness," American Annals of the Deaf, 101:240, March, 1956.

98 McGinnis, Kleffner, and Goldstein, op. cit., p. 241.

99 Ibid.

of which are in contradiction to the above. He states that the training room should be small, uncluttered, and simply decorated. At the beginning, the child should be kept close to the therapist, as the child's attention is kept longest when he is near by. The distance is then gradually increased. Materials must be appropriate, such as concrete objects and drawing which are simply outlined and have simple backgrounds. A language development approach is used, where speech correction is delayed until practical communication is achieved. The symbol must be appropriate to the act. Naming of objects is done. Utterances must be completely accepted without correction.¹⁰⁰

Some specific procedures used are: tachistoscope; systematic teaching of sounds, words, phrases, and numbers; phonetic training; use of special abilities; coordination of motor and mental processes; use of motor accompaniment to sounds and speech; imitation of teacher; manual manipulation of child's mouth; use of mirror; auxiliary amplification of tactile and kinesthetic stimulation accompanying production of sounds; building sound units into meaningful sequences; singing; and lipreading.¹⁰¹

Because the cooperation and understanding of the par-

¹⁰⁰ Myklebust, "Training Aphasic Children," op. cit., pp. 156-157.

¹⁰¹ Hoffman, op. cit., p. 87.

ents is so crucial, and because they are in constant contact with the child, Myklebust suggests some pointers for the parents:

1) Avoid stimulation. When it occurs, the child must be taken out of the situation and reassured in a calm, patient manner.

2) Help with listening. Play games that depend upon listening and buy toys that produce sounds. Work on one sound at a time. Talk in simple words.

3) Have simple routines for eating. The child should be seated next to the same person at each meal. He may need to eat alone. Serve one food on his plate at a time.

4) Use a specific toilet training routine. It must consist of patience, good timing, consistency, and be simple in demonstration.

5) Encourage language, but do not demand speech. The child should be allowed to use just voice for expressing ideas. Encourage expression in any way, including gestures.

6) Teach the child to play. Use toys that represent daily life and play out daily experiences. One can move from here to more imaginative and abstract play. Pretending is the basis for inner language.

7) Use patient firmness, not punishment. Discipline must be consistent. Anger adds to bewilderment.¹⁰²

¹⁰² Myklebust, "Training Aphasic Children," op. cit., pp. 154-155.

There must be a repetition, prolongation, and accentuation of the normal process of speech development. The child will profit from speech training only when he wants so much to communicate that he repeatedly attempts some form of communication. Once this attempt has been made consistently, the child will respond to speech training.¹⁰³

Prognosis

The prognosis corresponds to the severity of the original lesion,¹⁰⁴ but most of the authorities feel that with proper training at an early date it will usually be good. Karlin finds that aphasia following convulsions or an attack of migraine may last a few days or disappear in a few hours. In cases of brain tumor or abscess, once the underlying pathology is removed, recovery from the aphasia is usually complete; it may disappear automatically in approximately four weeks. When aphasia is due to hemorrhage or injury, the aphasic symptom may become chronic, and recovery will occur only after special speech therapy.¹⁰⁵ The patient responds well to intensive speech therapy using visual, auditory, and tactile clues.¹⁰⁶

When lesions occur in children who have not yet begun

103 Hoffman, op. cit., p. 86.

104 Guttman, op. cit., p. 216.

105 Karlin, "Aphasias in Children," op. cit., p. 757.

106 Van Gelder, Kennedy, and Laguaite, op. cit., p. 53.

to talk or in whom the speech function is not fully developed, complete absence of speech results. In older children, speech loss is not complete, but is quite fractional. In time, the young child with congenital aphasia will often begin to talk just as a normal infant first learning to speak: first inarticulate sounds, then single words, then phrases, and finally short sentences. In some cases, a childish lisp may persist for several years.¹⁰⁷ The brain can compensate for, and recover from, such injury. Every case of aphasia has the possibility for some degree of successful retraining.¹⁰⁸

Summary

Aphasia has been defined as an impairment of language ability, congenital and acquired, sensory and motor, which results from a disturbance of function of the central nervous system in certain areas of the brain dealing with speech and language. A child is any person under sixteen years of age.

The general consensus of the literature, although there are many points of disagreement, is that there are certain speech and language areas in the brain, injury to which causes some form of aphasia. However, because of the extensive interaction of all parts of the brain, injuries to speech and language centers may affect other functions, and injuries to

107 Guttman, op. cit., p. 206, quoting Ford, 1937.

108 Hart, op. cit., p. 114.

other parts of the brain may cause speech and language interference. The etiology may be of many sources, including infection, hemorrhage, and blows to the head. The incidence of aphasia is unknown, but it occurs in males five times more often than in females. Aphasia as the primary cause of speech and language difficulty occurs in children of normal or borderline intelligence.

Many descriptions of the symptom complex are given, and many of them are quite conflicting. Apparently, the child may manifest almost any type of behavior, and he generally presents characteristics of several disorders. Only an experienced diagnostician can discriminate which symptoms are primary indications of the disorder and which are secondary concomitants. A diagnosis of aphasia can be made only after tests are made in many areas, the child has been observed over an extended period of time, and a detailed case history has been compiled.

Training generally follows Myklebust, with an emphasis on the development of inner language initially, paralleling normal language development, or McGinnis, Kleffner, and Goldstein at Central Institute for the Deaf, using the "Association Method." Both methods demonstrate satisfactory results.

Prognosis is in general good, proportionate to the type of etiology and the severity of the injury. With proper early training, the majority of these children can become socially normal individuals.

CHAPTER III

ANNOTATED BIBLIOGRAPHY

This chapter contains a listing and annotation of all sources obtained. Sources known but not obtained are listed after the annotated bibliography under "Other Sources." The author index contains the authors found in both bibliographical listings.

In the annotated bibliography, the articles are listed under the following headings: Definition; Theoretical Aspects; Etiological and Neurological; Language and Verbal Aspects; Behavioral Aspects; Testing and Differential Diagnosis; Teaching and Therapy; General; and Case Studies. No article is listed twice, even though it may cover more than one area; it is listed under the area of its primary emphasis. If a source gives fairly equal coverage to several areas, it is listed under "General."

The sources in "Other Sources" are listed alphabetically by author.

Each source will be given a number, and these will run chronologically from the beginning of the annotated bibliography to the end of the other sources. The author index will be listed alphabetically, with only the numbers of the sources listed after the author's name.

Definition

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- (37) Bender, Laretta, "Problems in Conceptualization and Communication in Children with Developmental Alexia," Psychopathology of Communication. P. H. Hoch and J. Zubin; New York: John Wiley and Sons, Inc., 1958. pp. 155-176.
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- (49) Myklebust, Helmer R., "Language Training: A Comparison Between Children with Aphasia and Those with Deafness," American Annals of the Deaf, 101:240-244, March, 1956. Outline of differences and suggestions for a general frame of reference for the development of language in any child who presents a problem of language acquisition. It deals only with the receptive aphasic. The article is very general.
- (50) Myklebust, Helmer R., "Training Aphasic Children: Suggestions for Parents and Teachers," The Volta Review, 57:149-157, April, 1955. For parents and teachers. Definition of language and explanation of language development. Excellent.
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- (52) Strauss, Alfred A., and Ernest N. McCarus, "A Linguist Looks at Aphasia in Children," Journal of Speech and Hearing Disorders, 23:54-58, February, 1958. Description of child's language and language development. The utilization of linguistics in the training of aphasics. Specific methods are not given.

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- (54) Wepman, Joseph M., and others, "Psycholinguistic Study of Aphasia: A Revision of the Concept of Anomia," Journal of Speech and Hearing Disorders, 21:468-477, December, 1956.
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- (59) Biorn-Hansen, Vera, "Social and Emotional Aspects of Aphasia," Journal of Speech and Hearing Disorders, 22:53-59, March, 1957.
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- (60) Cohen, Peter, "Rh Child: Deaf or 'Aphasic'? 2. 'Aphasia' in Kernicterus," Journal of Speech and Hearing Disorders, 21:411-412, December, 1956.
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- (67) Weiss, D. A., "Speech Retarded Children," The Nervous Child, 9:21-30, 1951.
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- (69) Chesher, Earl C., "Aphasia: Technic of Clinical Examinations," Bulletin of the Neurological Institute of New York, 6:134-144, January, 1937.
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- (70) Eisenson, Jon, Examining for Aphasia. New York: The Psychological Corporation, 1954. Chapter 4.
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- (71) Goldenberg, Samuel, "An Exploratory Study of Some Aspects of Idiopathic Language Retardation," Journal of Speech and Hearing Disorders, 15:221-233, September, 1950.
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- (77) Monsees, Edna K., "Aphasia and Deafness in Children," Exceptional Children, 25:395-399, 1959.
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- (78) Nance, L. S., "Differential Diagnosis of Aphasia in Children," The Journal of Speech Disorders, 11:219-223, September, 1946.
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- (88) Froeschels, Emil, Psychological Elements in Speech. Boston: The Expression Company, 1932. pp. 72-86.
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- (89) Getz, Steven B., "Non-Organically Deaf Children in Schools for the Deaf," Exceptional Children, 21:204-206, March, 1955.
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- (90) Granich, L., and G. Pangle, Aphasia: A Guide to Retraining. New York: Grune and Stratton, 1947. 106 pp.
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- (91) Guertin, Wilson H., "The Achievement and Abilities of a Group of Educable Mentally Handicapped," Journal of Educational Research, 50:145-150, October, 1956.
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- (92) Hoffman, Jeanette Anderson, "Training of Children with Aphasic Understanding," The Nervous Child, 9:85-88, January, 1951.
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- (93) Jellinek, Augusta, "Agnosia, Aphasia, and Apraxia Phenomena Resembling Mentally Defective Children and Adolescents," The Journal of Speech Disorders, 6:51-62, March, 1941.
Description of cases and methods of therapy with mentally retarded children who demonstrate phenomena resembling the aphasias.
- (94) Kastein, Shulamith, "Speech and Language Habilitation in a Post-Encephalitic Child," American Journal of Mental Deficiency, 56:570-577, January, 1952.
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- (95) Kleffner, Frank R., "Aphasia in Children: Recent Research, Teaching Speech and Language, and Implications for Schools and Classes for the Deaf," Report of the Thirty-Ninth Meeting of the Convention of American Instructors of the Deaf. Washington: United States Government Printing Office, 1960. pp. 80-85.
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- (101) Martin, T. W., "Toronto Class for Aphasic Children," Exceptional Children, 25:34-40, September, 1958.
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- (102) McGinnis, Mildred A., Frank R. Kleffner, and Robert Goldstein, "Teaching Aphasic Children," The Volta Review, 58:239-244, June, 1956.
Report of teaching procedures at the St. Louis Central Institute for the Deaf. Primarily for therapists who work with aphasic children. Detailed explanation of what they have found to be a successful teaching method.

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- (104) Monsees, Edna K., "Experiences with Children Who Failed to Learn to Talk When Taught as Deaf Children," The Volta Review, 60:328-330, September, 1958.
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- (105) Pollock, M. S., "Releasing the True Intellectual Capacities of a Young Aphasic Child Through the Unfettering of Emotional Bonds," American Journal of Mental Deficiency, 63:954-966, 1959.
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- (107) Russell, C. M., "Three Hours a Week with a Word Deaf Child," American Journal of Mental Deficiency, 47:456-461, 1943.
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- (108) Schneiderman, Norma, "Teaching the Child with Delayed Speech," Education, 79:419-422, March, 1959.
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- (109) Sheer, Daniel E., "Is there a Common Factor in Learning for Brain Injured Children?" Exceptional Children, 21:10-12, October, 1954.
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- (111) Strauss, Alfred A., "The Education of the Brain-Injured Child," American Journal of Mental Deficiency, 56: 712-718, May, 1952.
General discussion of education principles. No specific mention of aphasia.
- (112) Sweet, Marie Elliott, "Association Method for Aphasics -- Its Application to the Deaf," The Volta Review, 57: 13-15, January, 1955.
The method itself. Brief statement of its success with deaf children.
- (113) Taylor, Martha L., and Morton Marks, Aphasia Rehabilitation Work Book. New York: Institute of Physical Medicine and Rehabilitation, New York University-Bellevue Medical Center, 1955.
Mainly for adults. Workbook designed for use by any untrained person responsible for the rehabilitation of an aphasic person. It is for patients who have difficulty saying, reading, or writing more than ten of the words on the basic word list.
- (114) Turnblom, Martha, and Julien S. Myers, "A Group Discussion Program with the Families of Aphasic Patients," Journal of Speech and Hearing Disorders, 17:393-396, December, 1952.
Report of a successful program of aphasia rehabilitation through the counseling of families and friends. General principles outlined, but primarily useful and relevant to the adult aphasic.
- (115) Wepman, Joseph M., Recovery from Aphasia. New York: Ronald Press, 1951. 263 pp.
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- (116) Wepman, Joseph M., "The Relationship Between Self-Correction and Recovery from Aphasia," Journal of Speech and Hearing Disorders, 23:302-305, August, 1958.
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General

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- (118) Berry, Mildred F., and Jon Eisenson, The Defective in Speech. New York: Appleton-Century-Crofts, Inc., 1942. pp. 420-439.
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- (119) Cohn, Robert, and Meta A. Neumann, "Jargon Aphasia," The Journal of Nervous and Mental Disorders, 127:381-399, November, 1958.
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- (120) Froeschels, Emil, Dysarthric Speech (Speech in Cerebral Palsy), Magnolia, Massachusetts: The Expression Company, Publishers, 1952. pp. 20-36.
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- (121) Goldstein, Kurt, Language and Language Disturbances. New York: Grune and Stratton, 1948. pp. 34-43.
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- (122) Guttman, Eric, "Aphasia in Children," Brain: A Journal of Neurology, 65:205-219, 1942.
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- (123) Head, Henry, Aphasia and Kindred Disorders of Speech, 2 Vols. New York: The Macmillan Company, 1926. 979 pp. Coverage of all aspects of aphasia including various theories. Presentation of clinical cases. References to aphasia in children sprinkled throughout. Little distinction made between aphasia in adults and aphasia in children.
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- (125) Ingram, T. T. S., "Specific Developmental Disorders of Speech in Childhood," Brain: A Journal of Neurology, 82:450-467, 1959. Study of eighty cases of retarded development of articulation, including developmental dyslexia and dysgraphia in terms of histories, speech defects, and clinical findings at the Speech Clinic of the Royal Hospital for Sick Children, Edinburgh.
- (126) Jellinek, Augusta, "Understanding of Speech," The Nervous Child, 9:15-20, January, 1951. Mainly for a general understanding of hearing and related areas, including aphasia, epilepsy, and others. Is not primarily concerned with aphasia except as it is related or similar to other expressive and receptive disorders.
- (127) Karlin, Isaac W., "Aphasias in Children," A. M. A. Journal of Diseases of Children, 87:752-767, 1954. Excellent article for clinical therapist. Diagrams of the brain are very helpful. Includes a section on differential diagnosis. Deals primarily with congenital aphasia, although it touches on acquired aphasia. Suggests a new means of classification.

- (128) Kastein, Shulamith, "The Different Groups of Disturbances of Understanding Language in Children," The Nervous Child, 9:31-52, January, 1951.
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- (129) Kussmaul, Adolph, "Disturbances of Speech," Cyclopaedia of the Practice of Medicine, Vol. 14. H. von Ziemssen, editor; English edition; New York: William Wood and Company, 1877. pp. 581-865.
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- (130) Lewis, R., The Other Child: The Brain-Injured Child. New York: Grune and Stratton, 1951. 108 pp.
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- (131) McHugh, Hollie E., and R. Hall McCoy, "The Evaluation of Hearing in Preschool Children Who Lack Speech. A Preliminary Report," The Laryngoscope, 64:845-860, October, 1954.
 Study of sixty children at Children's Memorial Hospital, Montreal, Canada, using the method of Myklebust to differentiate the deaf or hard of hearing, the brain-injured, the autistic, and the mentally retarded. Good diagrams. Mainly general principles, including differential diagnosis, for clinical audiologist. Is not specifically pertinent to aphasia.
- (132) Meyers, Russell, and Mary E. Meyers, "Adjustment Problems of the Aphasic Child," The Crippled Child, 28:10-11, April, 1951.
 Fairly general article. Good for an introduction to aphasia, or for general information for persons in contact with, but not directly training, an aphasic child.

- (133) Milman, Doris H., "Organic Behavior Disorder: Behavior Characteristics of Brain-Damaged Children," A. M. A. Journal of Diseases of Children, 91:521-528, 1956.
No mention of aphasia specifically. Good for clinician who wishes to give general principles of handling and understanding to parents of brain-damaged children.
- (134) Myklebust, Helmer R., "Aphasia in Children -- Diagnosis and Training," Handbook of Speech Pathology. Lee E. Travis, editor; New York: Appleton-Century-Crofts, Inc., 1957. pp. 514-530.
Excellent overview of distinctive symptoms, etiology, teaching and training, and prognosis. Especially useful to the therapist.
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Excellent for the layman's understanding of the nature of aphasia. Talks in terms of adults, but may be applied to children. Includes sources to which to write for additional information.
- (136) Orton, Samuel Torrey, Reading, Writing, and Speech Problems in Children. New York: W. W. Norton and Company, Inc., 1937.
Excellent introduction to the field of aphasia, even though somewhat outdated. Brief outline of the aphasias in adults; much more detailed description of the disorders of developmental language in children. Includes the treatment of certain of the disorders.
- (137) Philbrick, William A., "Implications of State Legislation for Aphasic Children," The Volta Review, 60:428-430+, October, 1958.
Existing state legislation, history of legislation. Advantages and difficulties.
- (138) Ross, Alan O., "The Aphasic Child," Education, 79:508-512, April, 1959.
Presentation of a case, differential diagnosis, brief physiological description of congenital aphasia, brief emotional characteristics, prognosis, and treatment.

- (139) Schilder, P., "Congenital Alexia and Its Relation to Optic Perception," Journal of Genetic Psychology, 65:67-88, 1944.
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- (140) Strauss, Alfred A., "Aphasia In Children," American Journal of Physical Medicine, 33:93-99, April, 1954.
Relationships to linguistics and psychology. Definition and types. General statement regarding testing and treatment.
- (141) Strauss, Alfred A., and Laura E. Lehtinen, Psychopathology and Education of the Brain-Injured Child. New York: Grune and Stratton, 1947. 200 pp.
Deals with historical review, neurology, description of symptoms, testing, diagnosis, and education of brain-injured children. Many diagrams and illustrative cases. Not specifically on aphasia, but the general information and principles are pertinent.
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CHAPTER IV

SUMMARY AND CONCLUSIONS

Summary

Because there exists today such conflicting opinion about aphasia in children, and because the material on it is so scattered, the object of this thesis has been to draw together the information about the theory and therapy of childhood aphasia, and to present as complete a listing as possible of the sources of opinion and information about it. One hundred sixty-one sources have been read and annotated, and thirty-one other sources are listed as having been unobtained. The author index lists one hundred eighty-nine authors. Unfortunately, some sources were inadvertently overlooked, and therefore they are not mentioned in this thesis.

Aphasia is defined as an impairment of language ability, congenital and acquired, sensory and motor, which results from a disturbance of function of the central nervous system in certain areas of the brain dealing with speech and language. A child is any person under sixteen years of age. The etiology, neurology, symptom complex, testing criteria and procedures, teaching and therapy principles and procedures, and prognosis are described and summarized. An annotated bibliography with author index forms the second half of the thesis.

Conclusions

Childhood aphasia is difficult to deal with specifically, because the literature is so varied without being specific. On the theoretical side, the most detailed treatments as well as the greater number dealing specifically with aphasia were by and large written before 1945, which, in terms of modern scientific standards, makes them outdated. The articles on therapy, however, are generally more recent, with several noticeable exceptions. There is not, therefore, always an obvious logical relationship between the theory and the therapy. Articles dealing with a definition of the disorder are conspicuous by their absence in recent years. This points up several crying needs:

- 1) An agreement between the field of speech pathology and the field of medicine on exactly what they are discussing. This would involve a specific definition of the syndrome in terms of neurology, etiology, time of onset, and symptoms. This may mean that new terminology will be found and the use of the term "aphasia" will be abandoned entirely when speaking of the disorder in children.

- 2) A care on the part of writers to utilize the accepted classification and terminology. The multiplicity of descriptive terms makes it nearly impossible for a reader to know

exactly what is being discussed. If there are errors and misrepresentations of the literature in this thesis, it is because writers have not specified whether the disorder about which they are writing is congenital or acquired, sensory or motor.

3) A description of exactly what happens neurologically in the retraining process.

4) More specific articles rather than ones dealing principally in general principles. Such articles must relate the specific procedure to the general principles and give the rationale for the general principles in terms of organic processes.

5) More discriminatory criteria and procedures in differential diagnosis.

6) More research on the relationship of the different types of aphasia to hereditary factors, handedness, intelligence, and multiple handicaps.

7) A detailed survey of the incidence of the different types of aphasia.

8) Separate works written, in very specific detail, for parents, doctors, therapists, and teachers.

In the light of the literature analyzed in this thesis, there is certainly a need for more information in the area of aphasia in children.