

MODERN THEORIES OF STUTTERING
AND THEIR THERAPEUTIC IMPLICATIONS

by

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CHAPTER I

ORIENTATION AND DEFINITIONS

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ORIENTATION AND DEFINITIONS

A feature which markedly sets man apart from the other animals is his superior ability to shape the world about him to suit his convenience. In the sphere of social relationships the culmination of this control of environment has been the development of language: speech, writing and gesture. Of these three forms of expression speech stands as the master instrument with which man controls his fellow men. Speech is not only the most important source of stimulation for the human organism but is also the most significant response made by man. For anyone dealing with people - psychiatrist, psychologist, minister or educator - a study of the speech of an individual and of his responses to verbal stimulation provides a direct approach to his personality. We may well accept as axiomatic

(1)

the statement of Travis: "When a man speaks he always reveals something. It may not be what he intended to disclose but nevertheless it is tell tale in some way".

In the course of evolution man's lungs, originally designed for the act of respiration, have become fundamental to vocalization. Normal breathing for the physiological needs of the body is carried on independently of conscious control. At anytime, however, breathing may

be voluntarily controlled for the purpose of voice production.

During inspiration the chest cavity is enlarged and, as the lungs expand to fill the space thus formed, air drawn in through the nose passes down the trachea and its branches into the alveolar cavities of the lungs. The enlargement of the chest cavity is caused by the combined action of the descent of the diaphragm, a double dome-shaped muscle separating the thorax and abdomen, and the elevation of the ribs.

In expiration the air is expelled from the lungs by the contraction of the thoracic cavity. Normally this is a passive movement caused by the relaxation of the chest wall and diaphragm and the elastic recoil of the lungs.

Speaking and singing demand the greatest voluntary control of respiration. For normal speech the vocal cords and the resonating and articulating chambers of the mouth and throat must be activated by a column of air which is sustained under constant pressure during a lengthened period of expiration. "The essential requirement for the production of voice consists, not in any alteration of the act of inspiration but in the production of a strong, steady and controlled act of expiration." ⁽²⁾ This prolonged expiration is maintained by the contraction of the abdominal muscles more "especially by the upper central part of the rectus abdominus." ⁽³⁾ This contraction forces the abdominal viscera upward against the relaxing diaphragm. The resulting pressure is sufficient to provide the required stream of air.

Table 1 shows a comparison of normal breathing (4)
with breathing during speech and song, as summarized by Seth and Guthrie.

"1. Expiration time equal to that of inspiration.	1. Expiration time greatly exceeds that of inspiration.
2. Automatic and involuntary.	2. Partly under control of will.
3. Small amount of air used - 500 cc.	3. Large amount of air used - 2000 cc.
4. Breathing through nose.	4. Breathing through nose and mouth."

TABLE 1

Speech is made up of fundamental laryngeal notes produced by the vibration of the vocal cords. These cords consist of a pair of membranous folds stretching across the larynx from front to back. The larynx itself is an intricate box-like structure situated at the upper end of the trachea. Its primary function is to regulate the amount of air entering the lungs and to protect them from the entry of foreign objects.

When vocalization is taking place the cords are drawn together so that they offer resistance to the passage of air from the lungs, the pitch of the voice being determined by the tension of the cords. In adult males the cords are approximately 18 m.m. in length while in women they measure about 12 m.m. This difference in length accounts for the deeper pitched voices of men. The change to a deeper voice in boys during puberty is caused by the rapid growth of the larynx

at this period.

The fundamental pitch of the voice is determined by the vocal cords and the larynx but timbre (the characteristic which makes voices of the same pitch sound differently) is supplied by the resonating cavities, the pharynx and the mouth. The air waves are modified during their outward passage by changes in the relative positions of the tongue, lips, teeth and palate. These changes mould the original vibration produced in the larynx into articulate speech.

Travis summarizes the description of the speech mechanisms as follows: ".... It would appear that there is not a single muscle group which has been developed to serve speech exclusively. The entire peripheral speech mechanism may be identified with biologically older and more fundamental vital functions which are seriously altered during vocalization. The movements involved in the earlier established functions are generalized, and although readily amenable to voluntary control, they are carried on largely unconsciously". (5)

CHAPTER II

SPEECH DEFECTS

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SPEECH DEFECTS

Normal speech depends upon the adequate formation and function of the various parts in the complicated speech apparatus. Abnormalities of formation or function on the other hand interfere with the speaking process and may have profound effects upon personality development.

If, for instance, an individual has a cleft palate or nasal malformation, he may fail to make himself understood and consequently his speech does not elicit the expected response. This immediately produces a tension or inadequate adjustment between the speaker and the one spoken to. The one wonders what the other is thinking about his speech defect while the other tries to guess what was said and what response should be made. Such tension producing situations when repeated tend to produce permanent unhealthy attitudes.

Travis' definition of a speech defect embodies the concept just presented. He says: "Speech or voice defect may be defined as an unusually conspicuous deviation in the speech pattern of an individual which is incapable of bringing about an adequate social response and which by the same token constitutes a maladjustment to his environment" (6)

Generally speaking most of the speech disorders commonly encountered fall into the following five-fold classification:

1. Delayed Speech. Children who are later than average in beginning to talk are said to have delayed speech. Cases of this type often show a parallel retardation in other fields of development and

frequently are mentally subnormal.

2. Articulatory Disorders. These defects are marked by the inability of the individual to make the proper muscle movements in producing a particular sound. Consonant sounds produced by faulty tongue and lip movements are usually involved. The specific disorders of this group are diagnosed by such terms as lisping, lalling, cluttering, speech clumsiness or oral inactivity, sound substitution, infantile speech and foreign accents. Articulatory disorders occur more frequently than any other type. Surveys show, however, that the higher the grade in school the fewer the children suffering from these defects.

3. Rhythmic Disorders. The disorders falling in this group are characterized by poor temporal co-ordination in the operation of the speech apparatus. The resulting condition is commonly known as stammering or stuttering.

4. Voice Disorders. The cases which fall in this category show speech with an abnormal phonation such as hoarseness or nasality.

5. Symbolic Disorders. The difficulty here is not in the formation of the sounds or in their proper patterning but is manifest in the inability to set the words in acceptable grammatical relationships. The disorders in this group are called aphasias. The condition is rare in school children, the White House Conference Survey reporting less than one aphasic child per ten thousand.

The third group, rhythmic disorders or stuttering, will be emphasized in the present discussion.

Some investigators (e.g. Bluemel) use the term stammering rather than stuttering but apparently refer to the same phenomenon while others introduce several differential diagnoses (e.g. Fletcher). There is also a third group of investigators which classifies the various disorders in the rhythm of speech under the more inclusive term spasmophemia (Travis and Stinchfield).

Both stammering and stuttering are probably the result of the same basic conditions but these disorders are distinguished (9) by Warren and others on the basis of their characteristic rhythms. Thus stuttering is used to indicate the repetition of sounds, words or phrases (e.g. n - n - n - never m - m - m - mind) while stammering refers to so-called speech blocks (e.g. ah - ah - ah - good-morning). When we consider, however, the repetition of the same sound or word as a transient speech block (an alternation between blocks and releases) any superficial difference becomes of minor importance. Physiologically, repetition of sound is, in terms of muscular reaction, clonic activity and blocking is tonic activity or a marked extension of the refractory phase of the clonic reaction.

CHAPTER III

OBJECTIVELY KNOWN FACTS CONCERNING STUTTERING

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Some of the findings of the Committee on Defective
(10)
Speech of the White House Conference will now be presented as an orientation to the various theories which have been advanced to account for stuttering. Certain other objectively known facts concerning the disorder will also be included.

The White House Conference Committee based its report upon a questionnaire which it sent out to 48 cities with populations over 10,000. The results of this questionnaire disclosed that on
(11)
the average five percent of school children exhibit speech defects. On the basis of this sampling there are some 1,200,000 children with defective speech in the schools of the United States.

The Committee has analyzed its data to show the relative incidence of the various disorders coming under the broader term of speech defects. The most common type of disorder was found to be articulatory defect, such as sound substitution and oral inactivity. Over 46 percent of the speech abnormalities reported resulted from such
(12)
poor vocal habits.

Stuttering is next on the list with an incidence of about 22 percent of the speech cases reported or approximately one
(13)
percent of the school population investigated. This finding is in close agreement with the results of others who have studied the incidence of

the disorder.

(14)

Conradi in a survey embracing 87,440 children in American City Schools found that 2.46 percent had speech defects and 0.87 percent were stutterers.

(15)

Wallin made a study of the school system of St. Louis (89,057 pupils in all) and found that 683 or 0.7 percent were stutterers according to his definition: "Stutterers - pupils who spasmodically or uncontrollably repeat the initial sounds of words (usually consonants) or who spasmodically repeat syllables or words". These 683 cases Wallin has subdivided as follows: 486 cases or 71 percent of the speech abnormalities found were classified as mild while he classed as severe 197 cases or 28 percent of the speech defectives.

(16)

Louittit and Halls report the results of a speech disorder investigation made in the Indiana schools. They found approximately one percent of stutterers in the school population that they studied. The grade distribution is shown in Table 2.

(17)

<u>GRADE</u>	<u>PERCENT STUTTERING</u>
New 1st Grade	0.93
1	0.73
2	0.97
3	0.80
4	0.88
5	0.81
6	0.77
7	0.80
8	0.62
9	0.69
10	0.66
11	0.39
12	0.41

TABLE 2

There is no available information on the incidence of stuttering in Canadian school children but it is safe to assume that the American percentages are applicable to Canada. Table 3 shows the number of children enrolled in the elementary and secondary schools of (18) (19) (20) Canada, British Columbia and Vancouver in 1934 and the probable number of stutterers, if we assume that one percent have the defect.

<u>PLACE</u>	<u>NUMBER IN SCHOOLS</u>	<u>NUMBER OF STUTTERS</u>
Canada	2,242,553	22,425
British Columbia	115,792	1,157
Vancouver	38,997	389

TABLE 3

There is a definite sex difference in the incidence of stuttering; the disorder being much more prevalent among boys than among girls. Table 4 using the data of West and Louttit and Halls gives the ratio of boys to girls in the various grades.

SEX RATIO AMONG STUTTERERS

<u>GRADE</u>	<u>BOYS TO ONE GIRL</u>	
	<u>West</u>	<u>Louttit and Halls</u>
I	3.1	3.3
II	3.4	3.8
III	3.6	3.0
IV	4.2	2.3
V	4.2	2.6
VI	4.0	3.4
VII	4.8	3.2
VIII	3.7	3.7
IX-X	3.7	2.7
XI-XII	5.5	3.9

TABLE 4

Stuttering characteristically manifests itself
(23)
early in the life of the child so afflicted. Travis reports that
generally the onset is gradual rather than sudden, especially in children's
cases. Often it is preceded by speech which is hesitant and uncertain
(24)
and marked by the repetition of sounds and words. Silverman investigated
a group of 50 stutterers and found that 72 percent of them developed their
speech defect before the age of six years when they started to school.

Available evidence does not indicate that the
(25)
stutterer is possessed of inferior mentality. West reports on a group of
4059 stutterers with an average Intelligence Quotient of 96.5. The dis-
(26)
tribution of these cases is indicated in Table 5.

<u>INTELLIGENCE QUOTIENT</u>		<u>NUMBER</u>
Below	50	3
50 -	60	27
60 -	70	100
70 -	80	417
80 -	90	806
90 -	100	1042
100 -	110	840
110 -	120	531
Above	120	293

TABLE 5

In spite of the fact that stutterers as a group
are endowed with normal intelligence they are about one and one half years
retarded in their school work. Using as his raw data Wallin's St. Louis
(27)
figures Fletcher worked out the extent of retardation. Fletcher's

findings are presented in Table 6.

<u>YEARS RETARDED</u>	<u>NUMBER OF CASES</u>
-1 (accelerated)	8
0	97
$\frac{1}{2}$	5
1	219
2	165
3	73
4	29
5	11
6	3
7	2

TABLE 6

(28)

Wallin found that the average retardation was 1.6 years in the case of both boys and girls. This retardation does not reflect the intelligence of the stutterer for in most cases the backwardness may be attributed to the defective speech. The child, being unable to express himself adequately in oral work, may pretend ignorance to escape the embarrassment of speaking.

There is a popular notion that it is unnecessary to make any effort to overcome speech defects as they are outgrown in the process of maturation. (29) Travis points out that while there is no reliable information upon the subject speech correction workers are of the opinion that 15 or 20 percent of children stutter at some time or other, usually between the ages of two and four years. If this be true, then most children do outgrow their defect for, as has already been indicated, about one percent of school children have the affliction.

It is interesting to make a comparison of the number of stutterers with the number of those exhibiting other disorders. (30) Travis estimates that there are about 1,000,000 stutterers in the United States of which number one quarter are children. He also reports that in 1920 there were 52,567 blind persons and 44,885 deaf mutes. From these figures it is obvious how great is the extent of this disorder, for there are in the United States about three times as many stuttering children as blind and deaf mutes of all ages combined.

The physical habitus of the adult male stutterer (31) has been investigated by Travis, Malamud and Thayer. Using the methods and concepts of Kretschmer these investigators studied the physical types presented by 175 unselected adult males, 47 of whom stuttered and 128 of whom spoke normally. They found that the majority of the stutterers and the minority of the normals fell into the leptosome group while the minority of stutterers and the majority of the normals fell into the athletic, pyknic and dyplastic groups. They state also that most of their stutterers showed the introvertive tendencies typical of the leptosome individual.

The authors sum up their research as follows:

"Because of the striking relationship discovered here between stuttering and physical habitus it seems reasonable to assume that constitutional determinants play an important role in stuttering. However, it is well to supplement this statement with the qualification that not all persons who are in this basic respect capable of stuttering need develop it. Whether or not they will develop stuttering depends upon further injuriously shaping formative and predisposing influences". (32)

This study gives rise to some interesting speculations. It is to be noted that the subjects were adult males. Perhaps

the dominance of stuttering leptosome adults may be explained by the tendency of the pyknics to outgrow stuttering more readily. The author has observed that those of leptosome habitus tend to stutter more severely and are less amenable to therapy than the pyknic and athletic types who usually show less severe stuttering and who respond more quickly to treatment.

It should be stated that the preceding discussion does not imply an acceptance of Kretschmer's theory of types. Investigations by Pollock and others have not substantiated his contentions. (33)

Such defects as physical deformity or blindness exert a definite and known effect upon the personality of the crippled or blind individual as well as upon the conduct of the normal individuals associated with him. His defect is thought of as an affliction which demands sympathy.

The general public, however, do not seem to regard stuttering in as serious a light. They derive great pleasure from comedians playing the part of the stutterer but do not react in the same way to fun at the expense of certain other defectives. The thoughtless acceptance by the public of this ridicule unfortunately does not eliminate or minimize the stutterer's personality problems or improve his outlook which is intimately tied up with his abnormal mode of expressing himself.

The influence of stuttering on the personality has been studied by Johnson. He worked intensively with a group of 80 subjects - 61 males and 19 females - whose ages ranged from 7 to 42 years, (34)

the average age being 19.2 years. As a result of his study he concludes that the emotional and social maladjustments which are characteristic of stutterers are not the cause of the speech trouble but rather are the result of it.

He reports also that the stutterer does not react in any important way to stuttering as such but rather to stuttering as he perceives or defines it. Johnson found that the common ways of defining the defect were as follows:

(35)

- "1. a handicap
2. a mark of inferiority
3. a way to talk, inconvenient at times but not an important reason for worry or shame
4. an advantage with respect to certain kinds of adaptation."

The stutterers who place their defect in the first or second categories are usually retiring and shy and do not live a normal social life. They have a biased and distorted outlook upon others who have no affliction. They are often very critical of the good times that they see those about them enjoying and, by their criticism, indicate their own longings to have part in the fun with the others.

Certain other stutterers, while sensitive of the definite handicap of their particular mode of speech, tend to make a more adequate adjustment. These people may compensate for the disability by attaining skill in some socially approved activity. A case in point is that of a young man, 21 years of age, seen in the Provincial Psychiatric Clinic, Vancouver. He is a tall handsome lad with dark wavy hair a flashing smile who always appears well and neatly dressed. He is well

endowed as far as intelligence is concerned, achieving a superior adult rating on the 1916 Stanford Revision of the Binet-Simon Scale.

He has a very healthy outlook with regard to his disability and he compensates for it by his definite excellence upon the saxophone. He is not seclusive but is rather an outgoing personality attending parties with his music, mixing with others of his own age and thoroughly enjoying himself. In his work, too, this young man has made a satisfactory adjustment; he is a bookkeeper in a business concern where he does not have to meet the public. This boy, however, is not reconciled to his disability. He regards it as a decided restriction upon his life, both in the social and business worlds, and consequently is a co-operative, well motivated subject in speech correction work.

In the treatment of stuttering the modern schools of speech therapy seem to have one thing in common, namely: consideration for the hygiene of the personality for each individual case. The social environment of the stutterer is carefully examined for any factors that tend to produce mental conflicts or other unhygienic mental states. If such conditions are found, pains are taken to remedy the situation.

For instance, if a case shows fear and embarrassment as a result of social reactions to his speech, this mental attitude must be overcome as soon as possible and the stutterer's confidence in himself restored. He may be shown that he is misinterpreting the behavior of his auditors and that the source of his discomfort and consequent distaste for meeting and talking with people is this mistaken inter-

pretation of their thoughts and behavior.

"A main goal to be achieved in the education of the stutterer's attitude toward his trouble is his impersonal evaluation of his disability. He must learn to objectify it and in some cases to accept it. The common practice of shielding him has worked against instead of for him..... He has often been taught to keep his trouble to himself, and as a consequence he often becomes undesirably introverted. Let us and the stutterer acknowledge first of all that he has a defect and that he and we are going to study it." (36)

CHAPTER IV

SOME HISTORICAL THEORIES OF STUTTERING

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Theories to account for stuttering and therapeutic methods based upon them are to be found in all ages. The early theories are unrefined as contrasted with most modern explanations and they deal with the most obvious aspects of the disorder. They postulate some anatomical anomaly or physiological dysfunction in the peripheral apparatus of speech so they direct their treatment to this region.

(37)

There is, for example, the prescription of Celsus, a Roman physician. Reports state that he had his patient gargle a decoction of thyme, hyssop and pennyroyal, drink much water and have the head, neck and mouth well rubbed. Further, he should chew such substances as mustard, garlic and onions, at the same time making decided efforts to articulate. There is no available record of the success attending this method of treatment but it may be suspected that any curative value would lie in suggestion or the distractive qualities of the medication.

Surgery has had a place in the treatment of stuttering, operations being performed upon the structures of the mouth - the symptom center of the disorder. There is record that, as early as
(38)
200 A. D., Galenus employed cauterization of the tongue. In 1841 Yearsley
(39)
and Braid were operating on the tonsils and uvula as a means of securing relief. Another group of surgeons directed their efforts to the tongue. Fletcher aptly remarks: "Almost every muscle of the tongue seems in its

turn to have been cut in the hope that the seat of the trouble might be located. The hypoglossal nerve was severed, the tongue was pierced with hot needles and blistered with embrocations of Croton oil. The lingual frenum was severed in the belief that it interfered with normal tongue movements". (40)

(41)

In 1841 Dieffenback published the results of his work in the field of speech correction. He claimed that a cure of stuttering resulted if a transverse slice was cut from the tongue, thus making it shorter. His technique is in contrast with the practice of those who cut the lingual frenum for this latter operation lengthened this organ. It is probable that distraction and suggestion account for any success attributed to surgery in cases of true stuttering.

Surgical treatment of stuttering has been succeeded by more rational schools of thought upon the disorder. Most modern schools agree that there is no anatomical defect in the speech apparatus of the stutterer. The trouble is that this equipment is not used correctly.

An early example of the functional approach is the method of treatment known as the American Cure. The founder of this system of therapy was Mrs. Leigh who, in 1825, stated that the stutterer's trouble was that he pressed the tongue against the lower incisor teeth when attempting to speak. Cure based on this theory was simple. The stutterer could be assured normal speech if he would press his tongue against the roof of his mouth when vocalizing.

CHAPTER V

SOME MODERN THEORIES OF STUTTERING

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The newer theories which have been formulated to explain stuttering are more elaborate. The advocates of these systems make an endeavour to fit their hypotheses to the objectively known data on the disorder. Another mark of differentiation is that these newer theories do not content themselves with treating the symptoms. They are inclined to go deeper and make an attempt to remove whatever they conceive to be the underlying causes.

The chief modern theories which endeavour to explain stuttering are:

1. Dunlap's Theory of Vocabulary Taboo.
2. Fletcher's Theory of Fear Conditioned by a Social Situation.
3. Travis' Theory of Reduction of Cortical Dominance.
4. Bluemel's Verbal Image Theory.
5. Swift's Visual Central Asthenia Theory.
6. Psychoanalytic Theories.
7. Adler's Inferiority Theory.

A theory of stuttering, which would account for the sex difference in the incidence of this condition, has been advanced by Dunlap. This is the Vocabulary Taboo Theory.
(43)

It may be summarized as follows: The young boy at about the time that he starts to school acquires from his youthful

companions a vocabulary of obscene words and expressions. He realizes that this new mode of expression, while making him a "regular fellow" with his playground associates, will be severely dealt with by his teachers and parents if it is heard by them. Fearing that he may disclose his tabooed vocabulary, he hesitates before speaking any word that commences with a sound similar to one of the profane words. This hesitation, Dunlap maintains, is essentially the beginning of stuttering; it tends to become more marked and spreads to other sounds.

Of course all young persons with a vocabulary of obscenities do not turn into stutterers. The unrefined young slum dweller is not concerned with repressing his improper language to the same extent but the young lad from a home of culture and refinement, especially if he be of a "nervous" disposition, has something to conceal. He has great fear of what would happen if an obscene word slipped out and therefore he is likely to become a stutterer.

This theory accounts for the small number of female stutterers by pointing out that young girls do not acquire an obscene vocabulary. They have nothing to conceal from their parents and teachers so they do not get into speech difficulties.

(44)

In more recent writings Dunlap appears to have modified his theory of causation. He now says that the causes are varied from case to case. In some instances the defect may be the result of malnutrition. The nutritional factor is not the sole cause but rather it acts as a predisposing influence to poor speech habits when the child is

brought up under adverse psychological conditions. These, it is stated, are wholly the result of the actions of the adults in the child's social environment. "Sometimes the child is restrained from speech unduly, sometimes he is forced to speak when he strongly desires to be silent. Sometimes his mode of speech is constantly subject to criticism. Sometimes he is in constant fear lest he inadvertently reveal something he would rather his elders did not hear. Often his general emotional attitude is constantly upset by family or school situations and this disturbance is reflected in disturbed speech expression." (45) This explanation still permits some cases of stuttering to be accounted for by the vocabulary taboo hypothesis but leaves an opening for other influences and conditions in the etiology of the defect.

The basis of Dunlap's cure is a specific case of his Beta hypothesis - voluntary stuttering on the part of the patient. Practice is the requirement for response modification - the responses may be fixed by practice or they may be changed. Thoughts, desires and ideals are the conditions which determine whether a response will be strengthened as it stands or be changed. "What we are to do, therefore, is to teach the patient to stammer voluntarily as nearly as possible in the way in which he now stammers involuntarily. Then we must cause him to practise stammering in this way under the conditions of thought and desire appropriate to the destruction of the habit which we are using as the basis for the practice." (46)

The first task of the psychologist who attempts to cure a stutterer is to point out to the patient the nature of his defect. Then he should motivate the patient so that he is desirous of speaking fluently. A speedy and effortless cure must not be promised by the trainer, indeed, it must be impressed upon the subject from the start that a long course of treatment will be necessary. The stutterer must be warned not to try to avoid his disability except under conditions

prescribed by his trainer for such an effort tends to fix the habit. During the period of re-education, the stutterer's family should pay no attention to his speech and should refrain from comments.

The practice period for speech therapy is usually about half an hour a day with best results from two quarter hour sessions. After three or four weeks of voluntary stammering a shift to ordinary speech may be attempted. If the patient has stuttered a phrase well, he is told to speak it correctly. Should he succeed on the first trial he is asked to repeat it a few times but, if he fails in this attempt, he is returned to voluntary stammering.

From this point there is an increasing emphasis upon correct speech. According to Dunlap it may take from three to six months to attain some degree of normal vocalization depending on the individual case. After treatment is suspended there should be frequent visits to the psychologist for observation. If there is any sign of stuttering, the treatment is recommenced for a period until the correct mode of response has been strengthened.

The vocabulary taboo theory is open to criticism as an explanation of the sex difference in the incidence of stuttering. It does not provide any data to show that girls do not have vocabularies of obscenities. To verify this theory it would be necessary to see if those girls who do stutter have the obscene vocabulary. Then there should be a comparison of the vocabularies of stuttering and non-stuttering girls to see if there is any significant difference. Again, the investigator

should compare the vocabularies of stuttering boys and girls for elements of similarity. Dunlap's revised theory seems to the writer to be one of the simplest and most scientifically sound attempts that has been made to account for stuttering. The therapeutic technique proposed employs acceptable psychological principles but requires further experimental verification to build up a body of statistical data.

Fletcher considers stuttering to be a form of social maladjustment. He would, therefore, probe the social environment of each case to discover the basic causes. This investigator holds that in relations with his superiors the stutterer is particularly sensitive concerning the impression that his speech and actions are making.

Fletcher states: "The author believes that it (i.e. stuttering) should be diagnosed and described as well as treated as a morbidity of social consciousness, a hypersensitivity of social attitude, a pathological social response. The morbid elements in this social response include typically, fear, anxiety, the feeling of inferiority and kindred attitudes arising out of a state of mind engendered by the realization of the necessity to meet, through speech, certain social requirements. The memory of previous failures to meet similar requirements serves to 'set off' these reactions. Both the social situation and the emotional response to it, we must point out, are specific not general." (47)

According to Fletcher's theory the primary origin of stuttering is in a chance occurrence. Upon ~~one~~ occasion when speaking with a superior the person fails and this inability to express himself makes such a profound emotional impression upon him that once again placed in a similar situation he stutters.

Fletcher's cure is to place the stutterer in a special environment where all his activities are directed so that he may become confident of himself in all his social relationships. This author

scouts clinical handling of the individual case in the artificial environment presented in a clinic situation. Fletcher suggests a complete change of the whole day of the stutterer. He would gather together the students who have the defect into a single classroom group. Their courses would be the same as those of the other children but the stutterers' class would be conducted in such a way that no undue attention would be drawn to the speech disability. There would be no occasion to make comparisons with normal children in this way accentuating the "social morbidity". The aim of such a class would be to draw the child out of himself, develop his powers of self-expression and direct him so that he would develop a healthy self-confidence in his social life.

Fletcher's theory is the best scientific exposition of the mental hygiene approach to the problem of stuttering. Other more popularly known representatives of the same school of thought are the Greene speech clinic in New York and the Dennison speech center at Kitchener, Ontario.

An obvious criticism of Fletcher's theory is that it is merely an hypothesis with no attempt made to give it statistical substantiation. This theory is not in accordance with the results of Johnson's study, already mentioned, showing that personality problems develop after stuttering has set in and thus do not ordinarily have a place in the etiology of the defect.

(48) (49)

Travis and Orton have advanced the theory that stuttering may result from a reduction of cortical dominance of the speech

apparatus. They regard the human organism as a dynamic whole which functions as a unit under different centers of physiological dominance. The most highly differentiated structures and functions need a very efficient center of dominance to bind them together for effective action.

The highest function of the human organism, according to Travis, is speech. For adequate vocalization the respiratory organs, the vocal apparatus and the articulatory apparatus must work in harmony. Thus, there is need for a center of unification to control the operations of these diverse elements and prevent them from reverting to their more basic activities.

Both Travis and Orton point out that the left cerebral hemisphere of strictly right-handed persons and the right cerebral hemisphere of strictly left-handed persons, contains the center of dominance for speech. It follows that anything that interferes with these centers will affect the speech and it is on this basis that change of preferred handedness is regarded as a causative factor in stuttering.

Travis states his position: "I conceive frank right-handedness or frank left-handedness as such to present no problem in the organism so long as either is permitted its natural expression. It is when either is interfered with to such an extent that through faulty training no handedness is preferred; or when natively no handedness is preferred.....that difficulties arise." (50)

To cure stammering Travis states that it is necessary to establish and maintain a dominant speech gradient in the central nervous system of the patient. This may be accomplished, according to Travis, by requiring the subject to practise certain exercises. There are five divisions each of which must be taken in its proper sequence.

"The first period consists in free-hand drawing of circles on the blackboard. In this exercise, as in the rest that follow, the natively preferred hand is employed. The length of training for this stage lasts from two days to a week depending upon the age and the progress of the case.

"The second period requires the writing of the alphabet and numerals. The alphabet should be written both in capitals and small letters. This period should not be shorter than a week for any person.

"The third period consists of speaking and copying at the same time. The individual begins to write each word before he speaks it, thus having the writing movements precede the spoken word.

"The fourth period.....should not be begun until the individual has become a facile left-handed writer. It consists of having him begin to write the first letter of a word just as or before it is spoken in ordinary conversational speech.

"As an individual's speech improves the number of sounds with which he has difficulty is reduced. The last period requires the individual to write the first letters of only those words which do cause difficulty." (51)

This theory has been subjected to a great deal of criticism. Wallin, in his survey of the 89,057 St. Louis school children, discovered 1,844 dextro-sinistrals and of these 173 or 9.4 percent had speech defects. Other surveys have tended to confirm Wallin's results. Thus it is probable that a relatively small percentage of school children who become dextro-sinistrals develop stuttering.

Recent writers upon this topic are inclined to take the position that change of handedness when accompanied by emotional upsets resulting from faulty methods of motivation and training may bring about an interference with the rhythm of speech.

Dunlap makes the unequivocal statement: "So far as studies show, there is no basis for the old theory (i.e. that change in handedness results in stuttering) and parents of left-handed children may

not fear to have the children's right hands trained, provided the training is correctly done. There is no doubt that the use of brutal and incompetent methods of training children, not only in respect to use of their hands, but in any way, may contribute to the production of stammering, or any other neurotic trait." (53)

Johnson says: "Critical analysis of data concerning the relative frequency of stammering among children to whom training has been given in changing from left hand to right preference in manual acts gives no basis for explanation of stammering as a result of this change." (54)

Dorcus and Shaffer state their position: "There is one factor which Travis has ignored in his discussion, namely, the widespread belief that a change in handedness produces stuttering..... It is possible that suggestion or belief in this idea is the predominant element in the situation. Since stuttering may be relieved by suggestion in many cases, auto-suggestion is not an improbable cause..... The writer wishes to stress the fact that a change in handedness itself may not cause stuttering but the method employed in changing the manual habits is of paramount importance." (55)

Bluemel has advanced a theory of auditory amnesia in the stutterer's brain when attempting to speak to account for the disorder. His theory accepts as fundamental the proposition that we speak as we think. If we think in English we speak English; if our thoughts are hurried so is our speech. "We make slips of the tongue only as we make
(56)
slips of thought". The stutterer who says p - p - pounds or there - there - there does so because he repeats this in his mind. He has no trouble in saying the letter "p" or the word "there"; rather his difficulty is in passing on to what follows.

Now, in the mental image of a word there are two elements, an auditory image, the sound of the word as we hear it and a motor image, the kinesthetic images as we speak the word. There are times when the motor image is recalled without the sound image. As a consequence

of this partial recall the word as the subject speaks it is fragmented. The speaker has only the motor image to go by so his speech is broken thus: "p - p - pounds!" He is unable to complete the word until he hears it mentally. To speak fluently it is necessary to have both the auditory image and the kinesthetic image of what is to be said.

In the more severe cases of stammering the motor image as well as the auditory image may be lacking - the whole word is absent from the mind. When this is the condition the stammerer makes no attempt to pronounce the word but repeats the preceding word in the hope that the missing images may return. His speech, in this type of stammering, is after the fashion: "there - there - there",

In the most severe cases of stammering, all mental speech may be completely wiped out. There is no verbal imagery and as a consequence no attempt at speech. The only activity is contortion of the facial muscles, holding of the breath, writhing on the chair and similar movements. The speech output is nil because there is no verbal thought, states Bluemel.

Even if it is granted that stutterers have this amnesia there still remains the problem of accounting for the phenomenon. Bluemel attempts an explanation by theorizing that a rush of blood to the head or perhaps cerebral anemia may account for the loss of imagery.

The author does not state definitely the reason for the postulated circulatory disturbances but his writing suggests that fear of a social situation may be a causative factor. Here, apparently,

is a variation of Fletcher's theory. In discussing "social morbidity" as a precipitating factor in stuttering it was pointed out that evidence seems to indicate that the stutterer does not stutter because he is afraid of a social situation but rather that he may be afraid of a social situation because he stutters.

Bluemel has formulated a very definite system for the cure of stammering. He says: "The remedy for stammering consists in thought training rather than speech training. This is necessarily so, since stammering is a thought disturbance and not a speech defect. In the corrective training, thoughts are disciplined by dulling them like soldiers; they are brought first into line, then into step and finally into orderly maneuver." (57)

During the course of training the stutterer speaks only in response to signals given with a castanet by the instructor. A light tap is the sign to speak, a loud one the sign to stop; while two light taps indicate that the subject is to repeat. By means of these signals the instructor compels his subject to think one sentence at a time, thus avoiding the confusion of rushing headlong into speech without sufficient thought. The pupil is to tranquilize his emotions during the pauses indicated by the instructor and decide what to say next. If he starts to stutter he is immediately stopped and there is a protracted pause during which he composes himself. He is then signalled to continue.

This form of drill is kept up with gradually increasing lengths between the pauses until considerable improvement is apparent. Then the stutterer is advanced a stage. He is allowed to signal for himself but his teacher is always present to control him if his stutter shows a tendency to return. After a certain further stage of

progress is reached the pupil is permitted to talk without the signals. He must speak with care and pause at the end of each sentence for the purpose of regaining composure and to permit him to formulate his next thought.

This method of treatment is consistent with the theory that stuttering is a defect of thought and not of speech, for it trains the pupil to think before he speaks. We are not, however, able to judge the efficacy of this method in practice for Bluemel supplies no statistics.

Of greater import than this, however, is the fact that the theory of causation is open to serious criticism. In the first place it is not proved that there is a lack of auditory images in the mind of the stutterer when he attempts to speak. Bluemel bases his hypothesis upon the returns of a questionnaire which he gave to a number of stutterers in an attempt to discover the nature of the characteristic imagery of this type of speech defective. Data gathered from a small number of stutterers untrained in the exacting art of introspection cannot be accepted as adequate evidence of the presence or absence of auditory images. The nature of mental imagery in normal people is one of the psychological problems about which least is definitely known. Bluemel has, therefore, no standard type of mental imagery with which to compare that which he reports to be typical of his speech defectives.

The supposed cause may be one of the effects of the disorder. It may be that the stutterer while talking cannot find auditory imagery because he is entirely preoccupied with the formation of speech.

Again, the ideo-motor theory is inadequate to account for

movement and speech. The cue to speech need not always be the auditory image of the sound to be produced. While auditory images may be useful they are too vague to be the sole guide to the delicate processes of speech production.

A further theoretical criticism of Bluemel's theory may be made of his assumption that speech and thought may be separated. Such an assumption runs counter to the teachings of the behavioristic psychology.

The use of the castanet in the correctional training is open to criticism on the grounds that it is a distraction mechanism akin to arm beating, head moving and finger snapping, as employed in certain popular cures.

A theory similar to Bluemel's is the "visual central as-
(58)
thenia" theory of Swift, who contends that faulty visual imagery is responsible for stuttering. He worked with a group composed of stutterers and normal speakers and had them repeat test sentences such as "The dog ran across the busy street". When a subject had repeated one of the sentences he was required to give a report of his imagery for the period of speaking.

Normal speakers, according to Swift, reported that they experienced visual imagery of the objects or situations about which they talked or of the words as seen on a printed page. The stutterers stated that they had little or no imagery or visualization at the time of speaking.

From the results of this experiment, Swift makes the

generalization that severity of stuttering varies inversely with the clearness of visual imagery at the time of speech.

Swift would cure stuttering by strengthening the visual imagery of his patient. This might be done by requiring the subject to talk about pictures or scenes which are directly in front of him. As his speech improves, the stutterer could gradually shift to more remote and more abstract topics for his conversation.

This theory may be criticized on the ground that the cue to speech need not always be a visual image. Many persons, indeed, report that they never experience visual images at all. It should also be pointed out that Swift has not proved that the stutterer lacks visual imagery at the time of speech. The subject may be putting so much effort into his attempts to speak that he fails to introspect and consequently is unable to report any imagery he may experience. In the present hazy state of knowledge with regard to imagery and the lack of support for Swift's findings, it seems unwise to take too seriously the apparent differences in imagery between stutterers and normal speaking individuals. This theory offers no adequate explanation for the transitory nature of the "visual central asthenia".

It is probable that cures based upon the therapeutic technique proposed by this theory could be accounted for on the basis of distraction of the subject's attention from the act of speech. Hollingworth aptly says: "It cannot be too strongly emphasized that the effectiveness of therapy has very little to do with the accuracy of the theory on which the therapy is based. This is true even in getting rid of mosquitoes".(59)

Psychoanalysts have not neglected the field of stuttering.
(60)

The theory next to be presented, that of Borden and Busse, is perhaps the best elaborated treatment of the analysts on this particular topic. These authors classify stuttering as a defect of speech which develops on the basis of a neurotic personality. They make the statement: "The symptoms of stammering arise as the direct or indirect result of the non-absorption of certain mental processes into the main stream of consciousness". (61)

These non-absorbed mental processes arise as a result of certain desires which the person must inhibit and which, because of his sensitive nature, he feels that he cannot acknowledge as part of his make-up. He does not make a healthy adjustment by admitting their presence and attempting their control. Instead, he fails to assimilate them and, by "purposeful forgetting", represses them to the unconscious mind where they take on an "autonomous existence and act as irritating foreign bodies
(62)
which are not properly absorbed by the digestive system". Thus stuttering is the symptom which indicates that the subject is the victim of psychic indigestion.

The repressed desires of the stutterer are not content to remain in the unconscious mind in a state of inactivity. Instead, they are continually fighting to get an opportunity to express themselves, and, in very subtle ways too, for they are wily enough to disguise their real natures. They attempt to slip up past the censor in symbolic forms which manifest themselves as stuttering. Thus stuttering is a code language by means of which the repressed desires in the unconscious mind of the patient come to expression.

The anxiety which is such an important item in the symptomatology of stuttering is to be interpreted as the person's fear of inadvertently disclosing the presence of "The incestuous, criminal and asocial desires which he has banished to the cellar of his mind." This fear also has the effect of disturbing the ordinary smooth flow of speech. (63)

For the treatment of this condition the authors recommend that the stutterer have recourse to a psychoanalyst. He will interview the patient and will discover the nature of his repressed desires by the usual procedure of dream analysis and the examination of childhood memories. These desires, when discovered, are explained to the patient and, once he comprehends them, the symptoms of stuttering are said to vanish. The writers quote William Stekel, a Viennese neurologist, on the mechanism of the cure. "In psychoanalysis we open the graves of buried desires. Out of them spring wild passions as from Pandora's Box. But these cannot stand the light of day. They fade and die, never to appear again. It is only the repressed thought that can lastingly disturb the equilibrium of the soul". (64)

This method of treatment is for Borden and Busse "The only system of therapeusis that holds out the promise of a scientific and permanent cure". They do admit, however, that there are three disadvantages to this method. First, there is the difficulty of enlisting the services of a skilled psychoanalyst. The second disadvantage is the relatively long time necessary for completion of the treatment and third there is the almost prohibitive cost of treatment. (65)

The most obvious criticism of this therapeutic method is to call attention to its basis in psychoanalysis. It rests upon such un-

founded psychological assumptions as the unconscious mind, the censor, suppressed desires and catharsis. Since none of these assumptions have been demonstrated scientifically and since their physiological mechanisms have never been demonstrated, the theory which rests upon them tends to become suspect.

Other members of the psychoanalytic school have discussed
(66)
stuttering but not to the same extent as Borden and Busse. Freud proposes an explanation based upon psychic trauma. He believes that the words upon which the patient stutters are related to particular psychic shocks which he attempts to repress. Conflict results and may manifest itself in a hesitating mode of speech.

(67)

Adler has advanced an inferiority theory to account for stuttering. He states that this speech defect is an attempt to withdraw by means of passive resistance from the superiority of others. It is based upon an intense feeling of inferiority in the mind of the person who manifests the disorder. Adler holds that the stutterer actually derives satisfaction from his affliction. He believes that the patient thinks thus: "What I would have been and done if I were not a stutterer".

This theory assumes that the stutterer's inferiority is not initially connected with his speech but may be associated with any of the bodily functions. There is, however, no reliable evidence to indicate that stutterers, as a group, are inferior in any anatomical or physiological respect or that they experience feelings of inferiority to a greater extent than non-stutters. If Adler's contention is correct, it may be that

the increased feeling of inferiority on the part of the stutterer is due to the fact that he stutters.

CHAPTER VI

CONCLUSION

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It seems apparent that one theory cannot adequately explain the phenomenon which is termed stuttering. Perhaps it would be nearer to the truth if we spoke of the "stutterings" as we now speak of the epilepsies. Such a terminology would permit stuttering to be the symptom or end point of a number of physiologically or psychologically disturbing influences. Dunlap's revised theory, which makes provision for a number of causal factors, seems to be the most acceptable of those discussed; stuttering undoubtedly may result from a number of factors or combinations of factors. It does not seem probable, however, that one theory of stuttering can harmonize all the objectively known data upon the disorder into a satisfactory synthesis.

Children of lowered visual acuity and those of weakened auditory acuity are given special classes or even a special school by the educational authorities of the Province. The mentally subnormal child has the advantages of a special class in which he is grouped with other children of his own type. Here he is able to compete with persons of his own level and his classroom instruction is so planned as to develop his potentialities to their fullest extent, at the same time training him to be a useful citizen insofar as possible.

At the present time there is a movement on foot to make some provision in the schools for the treatment of reading disability

cases for whom remedial instruction is definitely indicated.

Unfortunately, up to the present time, no serious attempt has been made by the school authorities anywhere in British Columbia to diagnose or treat speech defects in the school population. From time to time there are itinerant speech trainers who come to the Province and, from reports received by the writer, it would appear that these persons make a financial success of their treatment. Most of the therapeutic techniques employed by such persons are of the type based on the principle of distraction. Methods of speech correction involving this principle have already been discussed.

The author would strongly urge the school administrators to investigate the possibility of engaging the services of a scientifically trained speech therapist, to act as Director of Speech Correction. This person should be empowered to hire the staff deemed necessary and should organize and direct the correctional program.

Logically, the work of such a correctional program would fall into three divisions. The first problem would be to discover the speech defective children in the schools. It seems feasible to include a preliminary speech test as an integral part of the existing system of medical examinations. The medical authorities would be responsible for reporting the speech defective children to the Director of Speech Correction.

The second division of the work would be to diagnose the speech defect of the child. This would necessitate a complete

clinical examination of each child manifesting a speech disorder. Each case at this stage would be treated as an individual problem and would be studied from all possible angles. Heredity and family history would be investigated for stuttering, left-handedness, reading disabilities and abnormal mental conditions.

There should be a complete physical examination with considerable emphasis upon neurological tests. The developmental and health history of the subject should be correlated with the physical findings.

The emotional life also warrants a thorough investigation for often psychic trauma are as potent as physical injuries to the finely coordinated functions of the human organism. There should also be an individual intelligence test and a thorough investigation of preferred handedness.

The school history of the child should be at hand and, bearing in mind what the previously noted fields of investigation have disclosed, the examiner should attempt to account for any marked deviations in progress.

On the basis of these data the clinical group which studies the child will probably be able to diagnose the particular speech defect involved. When the diagnosis has been made it will be necessary to determine the type of treatment to be advised.

The actual treatment of the case constitutes the third step in the handling of the speech defective. It would be advisable

to group all stutters of similar age and ability in classes of their own. In a large school administrative area such as Vancouver it might be well to have a special school for the estimated one per cent of the school population who stutter (approximately 389 children). In any fairly densely populated rural area it would seem feasible to gather all the stutters from the area into one school where the trained speech therapist would work.

Children in such schools or classes would study the ordinary curriculum but would have as a group work of a general corrective nature such as breathing exercises, speech in unison and singing. With such children the rivalry in the homogeneous group would be a powerful incentive to normal speech.

Each case in a special class of this type would also receive individual correctional training for his particular disability. The writer would suggest the use of Dunlap's method for this part of the therapy program. That is, the stutterer would be required to practice voluntary stuttering to rid himself of his poor speech habits. The optimum time spent in voluntary stuttering would be approximately half an hour a day.

It is probable that in many cases such a treatment program would not be indicated. The nature of the specific individual therapy would be suggested by the causative factors as found by the clinical study of the case. Some cases where handedness is involved might profit more by the type of training advocated by Travis already

outlined in the discussion of his theory. Others might respond to the theory suggested by Bluemel. No matter what type of therapy is employed the trainer must recognize that suggestion will probably play an important part in the cure if one is to be effected.

The writer is aware of the difficulties that would lie in the way of a system of speech correctional classes or schools of the type outlined. To secure the financial support necessary to institute and maintain the proposed program would be most difficult. It would be hard to recruit a trained personelle for this work from the teachers of the Province as they have no opportunity for developing speech correctional methods or techniques. As yet no Canadian university seems to be aware of the rapidly developing science of speech therapy as absolutely no provision for its study is afforded in any existing university curriculum in Canada.

No matter how great the difficulties involved in starting a speech correction program the writer sincerely believes that it should be commenced immediately on as large a scale as possible.

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