

THE PROBLEM OF STUTTERING:

A CLINICAL and EXPERIMENTAL STUDY

by GEORGE SETH, M.A., B.Ed.,

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P R E F A C E.

The following pages contain the record of an investigation into the problem of stuttering which has formed part of a co-operative attack upon the disorder by various agencies - psychological, medical and educational - in the city of Edinburgh. The practical work of the research has been carried out in the University Psychological Clinic and in the George Combe Psychological Laboratory in the University of Edinburgh.

The arrangement of the material is as follows: Part I contains a critical discussion of the principal theoretical conceptions of the disorder which have been put forward; Part II covers the analysis of the data from the clinical examination; while Part III is a record of the results of the experimental investigation. The clinical notes upon the seventy-eight cases which constituted the main group of our subjects are collected separately in Part IV. In the discussion reference is made to illustrative material in the case-histories simply by citing the number of the case in question.

The writer is indebted to Professor James Drever under whose guidance the research has been carried through, to Dr. W.R. Dodds Fairbairn, whose willing help and fruitful suggestion have at all times been so readily given, and to /

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GEORGE SETH.

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I. The Problem of Stuttering.1. Introductory.

The clinical psychologist committed to the attempt to elucidate the speech disorder commonly known as "stuttering" or "stammering" very early finds that he has embarked upon a troubled sea of noises and hoarse disputes. Although the greater part of the enormous literature of the subject may be relegated to the class of psychological and neurological ephemera, he may well hesitate before breaking into a discussion which has served more often to obscure than to illuminate the questions at issue. As a result of superficial theorising, physiological and psychological, the whole field is at present in confusion. The facile dogmatism of premature hypotheses and jejune conclusions merely burkes the most stubborn problems in the origin and development of the disorder, and belies the peculiar difficulties and the uncertainty that attend even an apparently successful result in our attempts to devise a rational and practical scheme of treatment. The bewildering variety and the disconcerting variability of the symptoms of stuttering have made it nearly impossible to see the wood for the trees. But that neither excuses nor justifies premature over-simplification by refusal to see the trees or by blunt assertion that they do not exist. The analytical/

analytical psychologists, for example, have done well in their interpretation of stuttering as an oral neurosis to look an apparent gift-horse boldly in the mouth, but their neglect of manifestations which might require that they should look beyond this scarcely merits the same commendation.

In the interpretation of stuttering the principal difficulty is not in defining the symptomatology of the disorder, but in determining which of the symptoms are to be considered primary and significant, and which of them may be regarded as secondary and inessential by-products. The difficulties of explanation are the greater because of the frequent tendency of the symptoms, like the stutterers themselves, to palter with us in a double tongue, so that it is impossible from merely objective observation of the phenomena to determine which of two opposed interpretations of them may be correct. Is stuttering to be classed with the psycho-neuroses or, even although there is never any discoverable organic lesion, with the uncertain group of disorder generally included under the term "aphasia"? Is it the manifestation of a functional, although perhaps constitutionally determined failure in the organisation of the central nervous system/

system which is to be interpreted in neurophysiological rather than in psychological terms? Or is it the result of an arrest in libidinal development determined by misdirected influence or untoward circumstances at an early stage in the individual history? Or is it, as has been so frequently asserted or implied, a "fear-neurosis", akin to stage-fright? Or yet again, is it to be traced to a disturbance of the affective life which is to be regarded as a defect of personality and which can be explained without passing beyond the concepts of general psychology? Therapeutic efforts have been directed, nearly always with some measure of success, along the lines which would be indicated by an affirmative answer to any of these questions, although none of the implied interpretations has as yet found general acceptance. But in dealing with a functional disorder of this kind, successful treatment is not a proof of the validity of the theory upon which the treatment is supposed to be founded. Moreover, the impartial observer is haunted by the suspicion that the interpretation is frequently of the nature of wisdom after the fact, rather than being logically deducible from careful observation of the clinical manifestations of the disorder, and that the psychologists, no less than the speech trainers, have laid themselves open to the criticism that temporary amelioration of the condition has been too readily accepted as evidence of complete recovery.

It/

It is in the present state of our knowledge imperative that every individual stutterer should be considered not solely as a patient to be cured, but also and even more as a subject for strict empirical study. That investigation should be directed to elucidate the history of the development of the disorder, its clinical symptomatology, and its manifestations under controlled conditions of different kinds. Only then can interpretation be attempted in the light of the best neurophysiological knowledge we have at our disposal regarding the functioning of the central nervous system in the willed act of speech and of the most broadly-founded principles of clinical psychology which can be brought to bear upon the problem. And if, as in this matter is still probable, our verifiable knowledge must be eked out with speculation, we must beware of developing unnecessary theories ad hoc in order to buttress this or that vaguely conceived therapeutic practice, however admirable in itself. Apart from their heuristic justifiability, the value of our interpretations will be enhanced if they can be brought into alignment with psychological and physiological principles of more general applicability.

2. The term "stuttering".

In this study the term "stuttering" will be used throughout/

throughout to designate the speech-disorder under consideration except for those occasions where it may be necessary to quote from other writers who have preferred the term "stammering". In doing so we run counter to popular English usage, in which, although the two words, "stammering" and "stuttering", may be used interchangeably, the former has been generally preferred, mainly, no doubt, on grounds of euphony. Itard appears to have been the first writer to indicate in a short treatise published in 1817 that stuttering stands quite definitely apart from the other defects of speech, although he still described the disturbance of speech as a spasm induced by weakness of the motor organs of the larynx and tongue. About the same time Schulthess also drew a distinction between the speech-disorder, on the one hand, which is here called stuttering, and organically-conditioned defects of articulation or persistent defective manipulation of the speech-mechanism on the other. Like Itard, he failed to explain satisfactorily the differentiation of which he was vaguely aware, but he initiated a linguistic usage which has been perpetuated by Meumann and the German authorities on the subject generally. The word "Stammeln" has been employed by these writers to designate the larger group of defects of speech, while the term "Stottern" has been strictly reserved for the disorder with which we are concerned here. Recent investigators of the problems of speech-disorder and defect in America/

America (Fletcher, Travis, Bryngelson, and others) have shown a tendency to standardise the English equivalent of the German "Stottern" in the same sense. In England in the absence of authoritative pronouncement upon or thorough scientific investigation of the disorder, and in spite of the just and now generally admitted differentiation established by Schulthess between the two classes of disability in speech, popular usage has persisted. Scripture at all times employed the term stuttering as the exact equivalent of the German "Stottern", the word "stammering" being discarded by him, and the German "Stammeln" being replaced by the somewhat unsatisfactory substitute, "lispings". The only other suggested distinction between stammering and stuttering has never become general, and cannot now be maintained, although it is accorded uncertain recognition by the Concise Oxford Dictionary. It is implied in this usage that the stuttering disorder properly includes two distinguishable pathological affections of speech, the one being characterised by tonic speech-blocks or halts, and the other by clonic spasms of the vocal organs which manifest themselves primarily in repetition of the initial letters or syllables of words. The distinction is not a new one/

As early as 1829 Serres d'Alais was able at the end of a careful study of the disorder to classify two kinds of stuttering, both of which were to be traced to an affection nerveuse. Of these the one finds typical expression in clonic spasms of the articulatory muscles, while the other is the result of tetanus of the muscles employed in respiration and voice-production. In his recently published Abnormal Psychology Professor H.L. Hollingworth accepts this as the distinction between stammering and stuttering. He there defines the one as a "freezing" or "deadlocking" during speech in which no sound can be uttered for a long period while the other is the frequent repetition of the same sound or syllable in an uncontrollable and undesired manner. But no useful distinction can be established by observation between these clonic and tonic hesitations, although they may have a real significance for the interpretation of the disorder of which they are both the expression, if - as we shall suggest later - they make their appearance at different stages of its development. The terminological differentiation, between stuttering and stammering is on this basis, however, of no value. It may be that at some later date both of those terms of everyday speech will be replaced by a technical term with a definite and agreed signification, and without the/

the unwanted associations of the popular words. Already different authors have put forward different suggestions - associative aphasia (Hopfuer and Froschels), oral neurosis (Coriat), Dyslalia (Hudson-Makuen) - which serve to indicate where the emphasis principally falls in their explanation of the disorder. But the employment of any of these terms carries the implication of a certainty and a consensus of opinion which do not at the present time exist regarding the aetiology and the interpretation of the disturbance of speech.

In the absence of any established technical usage in English, the term stuttering is here employed in deference to long-standing German and recent American scientific authority. But its use must not be understood as prejudging the answer to any one of the open questions in the theory of the disorder. Even the problem of whether the contractions in the mechanism of articulation, which obstruct the utterance of syllables, may properly be regarded as spasmodic is for the present left undecided. By stuttering we understand at the moment no more than is implied in the relatively superficial terms of some such definition as the following: "a disorder characterised by failure of co-ordination in the complex mechanism of articulate speech, of which the principal overt manifestations are (1) the repetition/

repetition of a consonant or vowel, or hesitation during its articulation before being able to pass from it to the following sound, and (2) the disturbance to a greater or less degree of the rhythm of speech".

3. Historical.

The history of the theory and treatment of stuttering even during the nineteenth century is a blood-stained record of imperfectly realised guesses at truth and drastic and misguided attempts at cure by operative methods which showed no advance in understanding upon the cauterisation practised by Galen, or by instruction in elocution and exercises in articulation after the manner of those recommended by Mercurialis in the sixteenth century. Nevertheless, in the De Morbis Puerorum, published at Frankfurt in 1584, Mercurialis caught a glimpse of the principle which has only very slowly come into its own in our understanding of the disorder, namely, that stuttering is of central or psychic origin. Distinguishing between Balbuties Naturalis and Balbuties accidentalis, he was far ahead of his age, although he spoke perforce the language of his time, in his suggestion that the former, or chronic stuttering, was the result of an intemperies frigida and humida of the brain, which interfered with the normal functioning of the "central organ", while the latter, or accidental stutt

ering, may be induced by sudden violent emotion and other factors which exert their deleterious influence upon the nervous system as a whole. It is possible for present-day observers to uphold this classification by Mercurialis of cases of stuttering into two broad groups.

It is notoriously difficult in the analysis of the case-histories of most stuttering children to trace the origin of the disorder to any external factor, at least of an obvious kind, whereas, even if there were no other evidence for the assertion, the cases of stuttering which occurred amongst soldiers as a result of shell-shock during the War bear witness that the disorder may be traumatically aroused. But nearly three hundred years were to pass before there was any adequate scientific attempts to follow up either ^{of} the suggestions of Mercurialis. Without the previous advance in our knowledge of the physiology of the central nervous system and of the psychology of the emotions, it was impossible to carry further the theory of stuttering along either of these lines.

Nineteenth century theory and practice were alike vitiated by two related misconceptions of the disorder. On the one hand, stuttering was considered by nearly all the speech-trainers/

speech-trainers and medical investigators as a defect, and not a disorder, of speech. On the other, they persisted, almost without exception, until near the end of the period, in the belief that it was somatogenic in origin and, when the theory was not explicitly stated, acted upon that assumption. Hollingworth has a striking passage which describes the methods of treatment that prevailed and, indirectly, the conception of the disorder upon which it was founded. "Wedge-shaped portions were cut from the back of the tongue, the hypoglossal nerve, the lingual frenum, and the various extrinsic and intrinsic muscles of the tongue were severed. The tongue was pierced with needles, cauteries, blisters, and embrocations of petroleum, also croton oil were administered. Tincture of rectified alcohol, peppermint oil, and chloroform were applied. Wooden wedges were placed between the teeth. Smoking was recommended as a sedative to the vocal cords. These and various other remedies were devised on the assumption that the difficulty was organic and peripheral!"

The anatomical theories, each of which in turn proposed to regard a new element of the peripheral mechanism of speech as the primary seat of the trouble, can have been the outcome/

outcome only of the crudest of unscientific guesswork. The crass absurdity of the various explanations proposed becomes the more glaringly evident when we find the surgeons themselves making a desperate attempt to buttress up their uncertain operative practice by the importation of a few jejune psychological concepts. Dieffenbach's operation, which consisted in making a transverse incision in the root of the tongue, in some cases along with the removal of a sphenoid piece of that organ, enjoyed a short and astonishing vogue in Germany and France during the middle years of the last century. In the latter country some two hundred stutters are reported to have submitted to the operation during the first year after it became generally known. But the criticism of those who were from the first opposed to the practice gathered momentum when the "cures" proved to be less universal and less permanent than the originator of the method had promised. Its fall into almost complete disuse was as sudden as its rise to favour had been when it became known that the operation had been attended in a number of cases, by fatal results. In point of fact, Dieffenbach, like others of his contemporaries and successors had/

had traced the disorder to the spasms of the glottis, which by a process of "association" might make their appearance as secondary phenomena in the musculature of the tongue, throat, and face. Just before his method and conception of the disorder achieved their extraordinary popularity, Hervez de Chégoin in France had asserted that stuttering originated in a lack of freedom in the movements of the tongue, that it was apparently a form of "tongue-tie". His surgical practice, therefore, in opposition to that of Dieffenbach, which superseded it, and which had resulted in a shortening of the tongue, in the cases operated upon, attempted to release the stutterer by slitting the frenum, thus rendering the tongue effective in speech over a greater part of its length. In England Yearsley and Braid operated upon the tonsils or the uvula, in the belief that a malformation of either of these organs would interfere with the breath stream in such a way as to give rise to stuttering. This unsubstantiated assertion regarding the origin of the disorder lingered uncertainly in medical thought long after the operative practice of Yearsley and Braid had been discarded.

Similar hypotheses regarding the localisation of the defect/

defect were put forward by those who emphasised rather the stutterer's need of re-education in control of the mechanism of speech rather than for medical or surgical treatment. In principle their theories were no less crude and superficial, and in the practice of which they were the rationalisation frequently no less absurd than those of the surgeons, although they were less likely to lead to definitely harmful consequences, to kill where they set out to cure. Itard, whose name is still justly honoured for his work with the deaf and dumb, elaborated separate schemes of elocutionary exercises for children and adults. These were to be accompanied by appropriate medical treatment and a system of gymnastic exercises for the vocal organs, designed to strength^{en} the nerves of the larynx and tongue, in which a condition of congenital debility was supposed to give rise to stuttering. The jealously guarded "American method" of the notorious Madame Leigh, brought to Europe by the Belgian, Malebouche, rested upon the unwarrantable generalisation that in the vain attempts of the stut-
 terer to pronounce a word the tongue was kept lying too deep in the oral cavity, or pressed against the lower incisors/

She therefore directed her efforts to enabling the sufferer to compensate for this defect, on the one hand by exercises intended to strengthen the tongue and increase its mobility, and to render it more readily responsive to the impulses of the will, on the other by a refined form of torture by which the sufferer was compelled at all times to keep the tongue pressed against the palate. In order that there might not be even a momentary relaxation in virtue during sleep, a small roll of wet linen was placed under the tongue to keep it in place during the night. But all of the theories upon which techniques of educative therapy were founded were not so superficial or manifestly absurd as this.

Some of them looked sufficiently beyond the peripheral organs and the most obvious symptoms of the disorder to be able to trace the stuttering to the disturbance of breathing which was apparent during the stutterer's attempts to speak, if not at other times. But Coen, for example, went further than this and argued that the stutterer's faulty vocalisation and articulation were the result of a general weakness and irregularity of his respiration. He was of the opinion that the pressure of the pulmonary air in the case of the stutterer was ordinarily lower than in that of the normal speaker. In this supposition he/

he finds the rationale of the common difficulty of the stuttering speaker in articulating the explosives, p.t.k. At these stop-positions, normal innervation of the vocal organs produces a certain measure of resistance which presents a considerable obstacle to the individual who cannot summon up a pressure of air sufficiently strong to break through even this normal block. When the resistance of the speech-mechanism is not immediately broken, irritation of the muscles is set up so that spasmodic contractions appear. When the sufferer makes a direct effort to overcome the obstacle, tetanic cramp with accompanying manifestations throughout the musculature of the trunk and of the extremities supervenes. Few even of the later writers who show some insight into the psychological aspect of the disorder and take into account the prominent affective phenomena and the feelings of inhibition of the will-to-speak were able to carry the actual exposition of their speculation beyond the phenomena of the respiratory disturbance. The belief that respiratory anomalies extending beyond the actual period of stuttering are traceable and of direct aetiological significance has persisted with more or less of modification up to the present time. Even now it finds/

finds influential support in the work of Gutzmann's Berlin school, which has achieved considerable prestige since their system of treatment was adopted fifty years ago by the German Boards of Education. Clearly however, the theory raises at least two important issues. Firstly, are the manifestations of faulty respiration confined to periods of stuttering speech? Are they, that is to say, simply a less obvious and perhaps secondarily developed symptom of the disorder of function without fundamental causal significance? Or are the inefficient habits of breathing present also under conditions which do not give rise to stuttering or in circumstances where the stutterer is not required to speak? Answers to these questions have been given in directly opposite senses by Gutzmann himself, who maintains that there are anomalies of breath-control which are characteristic of the stutterer and which arise independently of the demand for speech, and by Fletcher who finds no characteristics of breathing peculiar to stutterers although breathing disturbances are present during stuttering. Secondly, whether such disturbances of the respiratory function are generally present or not, the troublesome question still remains of the causal factor which is at work to produce them.

An/

An important group of theorists and practitioners, beginning with Arnott in 1830, endeavoured to trace the disorder of function to the spasms of the larynx, or, more specifically the glottis, the theory being in some cases amplified by supporting speculations regarding the characteristics of the respiratory action in the stutterer. Arnott, in the chapter on stammering in his Physics, published in 1827 had suggested that the disorder was chiefly due to delayed action of the laryngeal or vocal mechanism. This is the view held by Wyllie and elaborated by him in The Disorders of Speech, published in Edinburgh in 1894 and still generally regarded as a classic in its special field. Drawing a comparison between the delicately co-ordinated movements of the hands in playing the violin and the action of the vocal organs in voluntary speech he says, "In the production of Speech, we find a series of movements, just as rapid and exact, and in like manner effected, if not, by two hands, at least by Two Mechanisms, acting like the hands of the violinist, in exact co-ordination one with the other. These two mechanisms are :-

(a) That of the larynx, which is the producer of the vocal element in speech, and thus is comparable to the bow-hand of the violinist.

(b) The Oral Mechanism, by which the sounds of the larynx can be modified in tone or timbre, though not in/

in pitch, as they pass through the oral cavity -----
 The oral mechanism may in some respects be compared to
 the string-hand of the violinist.

These two mechanisms must act together with a co-
 ordination as exact as that of the two hands of the vio-
 linist. A little inexactitude in this, only a little
 delay for example, in the production of the vocal element,
 and speech is at once interrupted, so as to become dis-
 cordant and laborious ----- The common defect of
 stammering is in the great majority of cases due to delay-
 ed action of the laryngeal mechanism; though it may,
 apparently in a minority of cases, be caused by delayed
 action of the oral mechanism. ---- In the common variety
 of stammering, the speaker neglects the laryngeal mechanism,
 and when no speech is emitted, he unwittingly throws in-
 creased force into the wrong quarter, viz., the oral mech-
 anism, whose nerve-centres thus become surcharged with energy,
 which may overflow into other centres and produce spasmodic
 complications" If such lagging action of one or other of
 the mechanisms occurs it will be aggravated to produce the
 characteristic symptoms of stuttering if, as Coen maintained,
 the breathing of the stutterer is weaker and more irregular
 than the normal. The peculiar difficulty of the various
 stop-consonants/

stop-consonants will arise if the respiratory pressure is insufficient to break through the resistance offered by the vocal organs when they are in position for these sounds.

On any such narrowly conceived physiological hypothesis is the characteristic phenomena of the disorder - its intermittent manifestations, its relatively far more frequent appearance in boys than in girls, and its stubborn intractability under training of the kind proposed by Wyllie himself, while it may yield to apparently much more irrational methods of treatment - remain unexplained, without the admission of psychological influences which are extraneous to the rest of the interpretation. But apart from these objections, the theory itself, like those which would trace the stuttering to disordered respiration, leaves unanswered the fundamental questions of how and why the inco-ordination ever arose.

Even before the surgeons had done their worst with the stutterers, however, the proposition had been put forward that the disorder must be regarded as the expression of a complete and multiform disturbance of the co-ordinated functioning of the entire speech-mechanism. It had even been/

been suggested that an ultimate explanation of all the problems involved would only become possible by pushing investigation further back, in the hope of tracing the origin of the trouble to the central nervous system. But in the then state of knowledge of the functioning of the "master system of the body", ~~even~~ the speculations of the earlier nineteenth century investigators failed to achieve any marked advance in our understanding of stuttering, although many of their hypotheses re-appear under various mutations in contemporary theory. One of the earliest of these more or less psycho-physiological interpretations was little more than an elaboration of the view that is probably even now most common in popular thought regarding the disorder, namely, that the stutterer tries to talk too fast chiefly because he thinks too fast. In terms of Rullier's theory, the rate at which the brain produces thoughts exceeds that which is possible for the innervation of the vocal organs. The mechanism of articulation has, as it were, a refractory period such that it is liable to become blocked, as it does during an attack of stuttering, if the calls upon it follow too thick and fast upon each other. But although the effort after rapid utterance does/

does lead to confused and disordered speech, the resulting disturbance, generally known as "cluttering", (which appears to be the equivalent of the German "Poltern"), is clearly distinguishable from stuttering. It is further to be doubted whether the stutterer ever really attempts to speak too fast except in a vain effort to overcome or evade the disturbance which has already mastered his speech.

In 1832 Sir Charles Bell described stuttering as a "very partial chorea", and argued that the disorder was the result of a failure of co-ordination in the neurophysiological mechanism which controls speech. The possible analogy between the two disorders can hardly fail to suggest itself to the most superficial observer of the cramps, spasms, and tic-like movements which are characteristic of both. But the parallel cannot be pressed, since in stuttering these occur only during speech or the attempt to speak, whereas the facial twitch and the physical contortions which typify chorea are not induced by the momentary situation of the sufferer, although they, too, are in general more severe under observation or in voluntary action.

The interpretation suggested by Marshall Hall and Lichtinger points forward to the quite recently propounded theory/

theory of Travis. ~~Along with~~ ^{Like} some of the latest German investigators of the subject, he proposes to regard stuttering as a "competition-phenomenon", and suggests that in its various manifestations it reveals competitive action or interference in the control of the speech-mechanism, either between opposing centres of the two cerebral hemispheres or between cortical and sub-cortical centres, such interference being the result of a relative diminution in the dominance during speech of the naturally preponderant hemisphere. According to the theory of Marshall-Hall, cerebral control is discounted in this way during the willed act of speech so that motor impulses of a reflex order originating in the spinal cord are set free to take an autonomous part in the activity. Since these are outwith voluntary control, their interference gives rise to the inco-ordinated functioning of the vocal organs which we recognise in stuttering. Lichtinger, as reported by Appelt, made some theoretical advance upon this hypothesis. Upon the basis of the supposition that the deficiency in cerebral control might be the consequence either of an actual diminution in the effective power of the cerebral centres, or of an increased spinal potential resulting/

resulting from abnormal excitation, he drew a distinction between cerebral and spinal stuttering. The ground of diagnosis in the individual case is not reported.

It behoves us to have more caution than is frequently displayed in our acceptance of introspective accounts of stuttering and its concomitant states of mental confusion and emotional distress by the sufferers themselves. It is impossible for the clinical psychologist to disregard the point of view of the patient himself, or to omit consideration of manifestations which so often appear in the very forefront of the disturbance. But the fact is too frequently lost sight of that stuttering cannot be regarded, either in its overt mechanical, or in its more obscure psychological manifestations as a static condition. Until the developmental changes in the characteristics of the disturbance, and in the attitude of the individual stut-terer towards it, have been fully analysed, it is impossible to base conclusions, particularly as regards the causal factors at work, upon the introspection of the sufferer when the trouble is already fully established. Whether or not the root of the disorder is to be found in some disturbance of physiological function or in the unconscious, it is by that/

that time impossible for the stuttering subject to distinguish between aetiologically significant factors and others which have arisen as a reaction to, or compensation for, or defence against the disturbance of his attempts at oral communication. It is, nevertheless, a suggestive fact that of the earlier investigators of the problems of the speech-disorder, one of the first to lay particular stress upon the psychic factors at work, and to put forward a quasi-psychological interpretation was himself a stutterer, namely, Merkel. But even he, as the title of his book, Physiologie der menschlichen Sprache, (published in 1866), indicates was unable to preserve the strictly psychological point of view. More emphatically than his predecessors, and in vague terms that were followed by some of his successors, he attributed stuttering to a weakness of the will such that the activities of articulation, and vocalisation were out of tune. It is more especially, as Wylie and others who wrote from a different viewpoint, had suggested, the effort of vocalisation and the action of the vocal cords that escape from voluntary control, as a result of a prior failure in the regulation of respiration. Logically, therefore, it is upon the vowels and vocalisation, as distinct from the articulation of the consonants in speech, that attention ought to/

to be directed in any attempt at amelioration of the disorder. Inefficiency of the "will", or misdirection of the voluntary impulse is similarly emphasised in several of the interpretations put forward about the same time as or just later than Merkel's Respiratory disturbances were now traced to various psychic conditions, some of which are almost universally typical of fully developed stuttering. Investigators began to recognise without clearly understanding or explaining the influence of emotional attitudes of embarrassment or fear, and of constitutional or temporary lack of confidence, along with a re-assertion in some cases of the belief in the excessive rapidity of the stutterer's thought which demanded an equally excessive speed in the effort after self-expression. Schrank, who hovered between the suppositions of a somatogenic and a psychogenic origin of the speech-disorder, expressed the opinion that the stutterer becomes confused and flustered during voluntary utterance chiefly as a result of feelings of dread aroused by stimuli which do not so affect the normal speaker. We are inevitably driven back by such a theory, which is manifestly incomplete in itself, upon the postulate of a constitutionally neuropathic diathesis. Schrank himself held/

held that the feelings of dread may be externally aroused if the momentary stimuli are abnormally violent. In accordance with the "somatic" psychiatric theory, he assumed that in such circumstances there must occur pathological alterations in the brain or its functional organisation. Where the abnormal emotions break through into consciousness as "obsessions", without any apparent external provocation, such cerebral disturbances must have been originally present in order to account for them.

By the end of the nineteenth century the two main lines of enquiry which have been followed up by later investigators had become stabilised. All attempts to attach the disorder to a constant recognisable defect or anomaly in any of the peripheral organs of speech had failed as indeed, it had been doomed to do from the beginning. Two facts which are apparent on the most superficial case-study and observation render it inconceivable that the disorder should be a consequence of a malformation of the vocal organs. On the one hand, no matter how careful our investigation, we are able ^{in very many cases} almost invariably to ascertain that the stutterer has spoken freely for several years before the onset of the disorder. On the other, it is a matter of general observation and comment that/

that in nearly every case there are certain circumstances in which the stutterer speaks fluently and correctly. Such fluctuations are manifestly impossible if the defective speech is due to defect in the peripheral mechanism, and it had at least become clear that stuttering must be regarded not as a defect but as a disorder of speech. According as he approached the problem with a bias in one direction or the other, the individual investigator tended to look for an explanation of the disorder of function either to abnormal physiological or psychological conditions, both being sometimes recognised, in juxtaposition rather than relation, in the one theory. Anatomical guesswork had been discarded, but progress beyond this had been slow, haphazard, meagre in result, and at no time so clear and continuous as the preceding analytic discussion might suggest. Even when they were presented with all the compensatory dogmatism of an underlying uncertainty, the neuro-physiological interpretations seldom passed beyond the most unreliable tentative generalisations. And with the possible exception during the last decade of the century of the work of Ssikorski, and of Wyneken and Denhardt, which can be more appropriately noticed in the sequel, such psychological/

psychological theorising as existed was superficial in the extreme, and unsubstantiated by any considerable body of careful observation.

4. The Contemporary Position.

The absence of defect or structural abnormality of the peripheral organs of speech, and as is now generally admitted, of any discoverable organic lesion in cases of stuttering at once suggests that it should be regarded as a psycho-neurosis and investigated and treated as such. But, even if we leave on one side the plethora of fragmentary bio-physical and bio-chemical investigations conducted during recent years, frequently so unsatisfactory from the point of view both of number of cases and of controls, a large part of recent research, upon the problem has been grounded upon different hypotheses. No modern interpretation can afford to disregard the apparent psychological factors, in stuttering, if for no other reason than that it is a disorder of an activity which in its normal expression preeminently demands psychological interpretation. But there have not been wanting attempts, perhaps more often supported by elaborate experimental technique than by impressive findings, to interpret the different phenomena of the disorder as the expression of a disturbance of function in the central nervous system, of which it is possible by considering the phenomena themselves in the light/

light of neurological theory, to construct a conceivable and consistent picture. Only within the last twenty years has one line of approach been adopted which might have been expected, whatever it may be worth from the heuristic view point, to suggest itself earlier. When we recall the heated controversy which made aphasic disorders and their bearing upon the problem of cerebral localisation so prominent and popular as a topic of discussion in medical circles during the later years of the nineteenth century, it is surprising that none of the speculators had been impelled to consider the possibility of relating the stuttering disorder to one or other of the organic aphasias. Some, at least, of the writers upon stuttering were themselves, like Wyllie, authorities upon aphasia. They approached the problem with a full knowledge of the accepted contemporary position regarding cerebral function in its relation to speech. There had been in addition, tentative suggestions, such as that of Marshall Hall and Lichtinger already noticed, that stuttering must ultimately be traced to its source in a disturbance of cerebral function, but with the exception of some attempts which were not worked out, to classify it as a subcortical motor aphasia or aphemia, later writers gave little consideration to/

to the relation between the two types of speech-disorder. Lately, however, a group of workers in Germany, of whom the best known are Hoepfuer and Emil Froschels, have considered stuttering explicitly as an "associative aphasia". There are points of contact between the work of the German investigators and Travis's neurophysiological theory, while a similar though much cruder conception underlies Bluemel's theory of "transient auditory amnesia".

(5) Stuttering as an Associative Aphasia
(Hoepfuer, Froschels).

A very small number of cases of so-called stuttering in which an actual cerebral lesion was discovered have been reported by Kussmaul, but even these few are open to the criticism that they cannot properly be classified as cases of stuttering. The "stuttering", so far as it could be regarded as such, seems to have been rather a partial manifestation of a more extensive strictly aphasic disorder, in which speech as a whole was subject to much more severe disturbance. It was also much more persistent than the common variety of stuttering. Clearly, then, since there is in general no organic lesion, stuttering is not referable to any of the categories of fully developed aphasia. But it may not be without significance that we can point to certain facts or phenomena/

phenomena which are common to both disorders. Some of these have been indicated by Bluemel in his "Stammering and Cognate Defects of Speech."

2. Both stuttering and aphasia vary in severity with the tone, or in Head's terminology, the state of "vigilance" of the nervous system as a whole. The stuttering or the aphasia tend to decrease in severity according as influences, improvement in general health and the like, are brought to bear which enhance the vital capacity and physiological efficiency of the nervous system, and which pari passu, heighten the vigilance of those parts of the nervous system which are specifically concerned in the regulation of speech. Similarly the severity of these speech disorders tends to be increased as the vital capacity of the nervous system is diminished. This is properly the basis of the assertions of Bluemel that (2) stuttering and aphasia are comparable as regards their mode of origin. "Broadly", he says, "it may be stated that any cause that induces aphasia can also induce stammering (stuttering). Most of the causes that produce stammering (stuttering) can also produce aphasia". The causes - and for the moment we pass over the element of begging the question that is implied - that he instances are :
emotional/

emotional shock, traumata, infectious diseases, convulsions, and the like.

And that (3) stuttering may arise from causes which induce transitory aphasia, such as mental strain from overwork, lack of sleep, smoking too strong tobacco, acute infectious diseases, and so forth.

(4) There is an uncertain degree of parallelism between the variable and intermittent manifestations of stuttering and of aphasia. Bluemel asserts that stut-terer and aphasic alike frequently have command of a much greater fluency in reading aloud than in spontaneous speech. In some cases of stuttering, however, this state of affairs may be exactly reversed.

In many of the cases of stuttering which will form the basis of later discussion, the speech-disorder was not in evidence in interjectional speech or in more automatic utterances, e.g., giving name, age, address, or in conventional phrases of greeting, "Good-morning", and the like. It is also a not infrequent observation of the mother of a stutt-ering child that "he never stutters when he's fighting", or "he can speak quite well when he loses his temper." These phenomena/

phenomena can be exactly paralleled in any clinical study of aphasic disorder. They have an added significance when they are considered along with the probability, which is capable only of approximate assessment, in the individual case, that stuttering will increase in direct proportion with the difficulty of the material to be read. More specifically, the stuttering is ^{frequently} less in evidence, on the one hand, on monosyllables than on longer words, and on the other, in the reading of isolated words than of continuous prose or verse.

(5) In both stuttering and aphasia the sufferer is frequently able to repeat a set speech or phrase with relative ease when he is incapable of spontaneous speech with any degree of fluency.

(6) The speech of both the stutterer and the aphasic may reveal very clearly the influence of the environmental, and particularly of the social situation of the moment. In stuttering this is so much the case that J.M. Fletcher has maintained that the disorder is the expression of a personal maladjustment, a "social morbidity". But Bluemel quotes from Bastian a case which reveals "many remarkable points of resemblance to stammering", in which "the most striking feature was the patient's ability to speak in solitude when he could not speak to other people".

Head emphasises the sensitive reaction of the speech of the aphasic to the attitude of his interlocutor.

(7) If stuttering is to be considered as primarily a disorder of the function of language, the point of view of the earlier investigators in respect even of the external manifestations of the disorder demands revision. Following Head, we must look upon normal speech as a progressive act, a "march of events" in which the time-relation is all-important. In stuttering, as in the aphasic disorders, the significant fact is not ^{that} the sufferer has difficulty with this or that isolated sound, but that, the whole progressive elaboration of speech is disturbed, and its rhythm destroyed.

But the term "associative aphasia" coined by Hoepfuer and employed by Froschels to describe the stuttering disorder carries no suggestion of a detailed comparison or analogy between the objective manifestations of the two disturbances of speech. It appears, indeed, to ~~be intended to~~ imply ^{little} ~~no~~ more than an assertion of the central origin of the minor disturbance of function which affects the entire speech-act, the whole co-ordination of speech, while the addition/

addition of the word "associative" indicates the nature of Hoepfner's theory of the origin of stuttering in an emotional association built up in connection with the act of voluntary speech. It is not related, as we might have expected, to any theory of cerebral localisation or function. Historically, his interpretation is in the direct line of development from those of Wyneken and Denhardt and has been elaborated in opposition to that of the official by-law-established school, of Gutzmann and his followers. At a very much earlier stage Schulthess had proposed for stuttering the names "lalophobia" and "phonophobia", implying that the outstanding trait in the psychology of the stuturer is an obsessional fear of speech. In the first real attempts to work out the conception of stuttering as a functional disorder of essentially psychic origin, this idea re-appears. Wyneken calls the stuturer a "speech-doubter" (Sprachzweifler), liable to be assailed at ^{any} moment ^{by} ~~of~~ uncertainty or a disabling lack of confidence in his own powers of speech. "Were I to attempt an explanation of the case", he says, "I should say that the will is more or less restrained - so far as its control over the speech-muscles is concerned - and that this occurs through fear. The stuturer/

stutterer is a speech-doubter. When he attempts a difficult word, his will is partially lamed by doubt - which one can in a way regard as an independent will inimical to the true will. The muscles controlling respiration, phonation, and articulation do not know - if I may so express myself - which master to obey, therefore they do not perform their functions, and stuttering naturally ensues. It is just as though one were to attempt a leap, and find himself seized with doubt at the very moment that he springs. He is too late to prevent the leap, but does not jump with confidence, and hence does not accomplish what he intended".

For Denhardt, accepting the stutterer's introspective account of his mental state during the attempt to speak, the central fact is again the inhibitory influence of fear - fear arising from a delusional belief in his own inability to speak. Regarding his own powerlessness the stutterer has no manner of doubt, but a complete subjective certainty. The disorder is itself the expression of the conflict between two competing tendencies - on the one hand, the will to speak which initiates a movement, on the other the feelings of incapacity and fear which are the source of the obstruction. But/

But two stubborn problems are not resolved by Denhardt's theory. Without considerable amplification, without, indeed, the introduction of other than merely inhibiting factors, it will not account for many of the positive manifestations of the disorder. Secondly, the primary ground of the speech-disorder remains an open question. Denhardt provides the customary list of inducing causes, but like most of the clinicians who have followed him, fails to explain how these causes operate. If the stuttering does not merely continue for no better reason than that it has begun, the most that he can say is that in the individual case it is as a rule of accidental origin, and is thereafter confirmed by morbid fear of its recurrence.

The theory of Hoepfner and Froschels follows very closely that of Denhardt in its main outlines, but aware of its defects they indicate that the fundamental basis of the disorder is to be found not only in the psychological influences at work but in the psychoneurotic disposition which must, in the last resort be inherited, of the individual stutterer. Upon this matter, Froschels quotes Frank with approval: "Experiences shows that psychoneurotic conditions are extraordinarily readily transmissible ----- . We can observe that not only the predisposition as such is transmitted, but also a stronger/

stronger tendency directly to the reinstatement of the same specific form of psychoneurosis ----- And we continually find families in whom these, and certainly the same kind of anxiety- conditions are native. The child hears and sees these conditions, and thereby the existing predisposition will be determined".

In opposition to the interpretation of stuttering as a neurosis of co-ordination resulting from the physiological inadequacy or susceptibility of the central mechanism of speech, which gives rise also to the manifold involuntary movements which accompany the disorder, Froschels roundly asserts that every single partial phenomenon of stuttering has a psychological basis. The only exceptions to this generalisation which he will admit are a few negligible movements which are the result of neural irradiation, and the appearance of reflex movements of the alac nasi to which he attributes a special significance. Stuttering, cannot, therefore, be regarded, as it has been by Kussmaul and Gutzmann as an extra-mental, quasi-reflex condition around which there is secondarily developed a psycho-pathological syndrome consisting of inhibitions, inferiority-feelings and the like. We are not justified even in referring to many of the "Mitbewegungen" which appear during stuttering in the musculature of speech and elsewhere by terms such, as spasms/

spasms or cramps, which imply an assumption regarding their voluntary or involuntary nature. Many of these, as Froschels justly indicates are deliberately employed by the stutterer because they facilitate the effort of self-expression. For this reason, instead of calling them simply "Mitbewegungen", or accompanying movements, he would employ rather the terms "Mit-" or "Begleithandlungen", accompanying acts.

Gutzmann has traced the onset of stuttering in very young children and in school-pupils to the imperfect correspondence between the tempo of the child's thinking, and the range of his powers of expression, the size of his vocabulary and it's responsiveness to the demands made upon it, and the development of his grammatical-syntactical ability. The hypothesis is not without an element of valuable suggestion when we take into account the early age at which the disorder ordinarily establishes itself in the pre-school years or just after formal schooling has begun, and the common statement of those who associate with stuttering children that the disorder generally increases in severity when they set out to tell a connected story of any experience they have had. Since stuttering so frequently makes its first appearance in children about the age of three or four, there is reasonable ground for the/

the supposition that it might in these cases at least be connected with a stage or phase in the development of the child's handling of language. Although the facts as at present ascertained themselves afford no basis for conclusion, it might even be possible to find justification for an attempt to clarify the connection in some of the most trustworthy descriptions that have been published of that development in the normal child. One of the most striking facts brought out by Preyer's well-known record of the development of language in his own son during the three first years of life is the marked difficulty which a child experiences in his first attempts to pronounce syllables or words by a definite effort of the will, either spontaneously or at the instigation of adults with a didactic intention. The difficulty becomes all the more striking when we consider the apparent ease with which, for months previously, consonants and vowels have been produced during the period of babbling, and words and even phrases by a process of echolalia. There appears frequently to be a stage when the child's actual spoken vocabulary is paradoxically in advance of his real powers of speech/

speech, and in order that it may be made to serve the purposes of voluntary expression an actual regression, reculer pour mieux sauter, may take place. In Preyer's own boy - and he quotes even more impressive cases in an appendix - great difficulty, betrayed sometimes by efforts of straining, could be observed in his attempts to produce syllables at command for the first time. Not only has the child to learn to speak, but the acquisition of voluntary control over a vocabulary which he appears already to have in his possession may require a period of concentrated and persevering effort. It is perhaps to be doubted whether any direct connection could be established between the occurrence of the first attacks of stuttering and this stage of growing voluntary control over language, which stands in more obvious relation to the developmental defects of speech which are significantly common in children whose general mental development is seriously retarded. Stutterers as a group do not belong to this class, and in the majority of cases of stuttering in childhood it seems probable that the stage of greatest difficulty in this development has been passed before the speech-disorder has become apparent. But even/

even if this latter supposition were to hold good - in spite of the tendency of the most scrupulous and observant mother to postdate the onset of stuttering - the characteristics which distinguish this phase might well have an interpretative significance if the disorder could be related to the making of too great demands upon the child's powers of voluntary verbal expression at a time when the externals or the mechanics of speech still require a considerable part of his attention.

Froschels accepts Gutzmann's general contention that the discrepancy between the desire to express thought and the ability to speak is one of the causes which may give rise to stuttering and adduces in support of it a very clear case of psychological over-stimulation, especially as regards oral expression. But this disparity between thought and speech and the inadequacy of the central mechanism of articulation is not of universal application, and it does not provide a satisfactory explanation of all the manifestations of stuttering. The convulsive or cramp-like phenomena which are typical of the disorder need not necessarily make their appearance if we suppose that it originates solely in a lack of correspondence between the intention and the power to speak. In the speech-disturbance in which that disparity is the essential basis of the inco-ordination, namely, cluttering, no such phenomena and no appearance of strain are/

are manifest. If stuttering were the inevitable result of a functional inadequacy of the central mechanism of articulation, we should expect that cluttering would invariably be found in association with it, and never in a pure form, since here above all an undue demand is made even upon a normal mechanism. But this is not the case, Froschels concludes, therefore, that the really specific basis of the stuttering disorder seems to be the mental condition which causes the consciousness of disordered speech to become effective in "ataxic" speakers. In cluttering this is absent, since the sufferers pay scarcely any attention to their speech.

Superficial observation, in part an admission of the difficulty of observing the phenomena, in part a confession of defeat in the attempts at interpretation of them from an objective point of view, has generally considered stuttering as an "all-or-none" disorder, which was either present or not. It is not the least significant contribution of Hoepfner and Froschels to the theory of the speech disturbance that they have maintained that it cannot be regarded as a stationary condition, once and for all established at the outset. Change and development are distinguishable both in the external manifestations and in their psychological concomitants/

Froschels has gone so far as to suggest that the overt symptoms show four successive but overlapping stages of development which show sufficiently well-marked characteristics to enable us to arrive at some conclusion as to the length of the period during which the disorder has been established. At the outset, in children of from four to seven years of age the stuttering is invariably purely clonic in nature. There appears, that is to say, pure repetition of sounds and syllables without the remotest hint of cramp or spasm. The breathing shows no abnormality, and accompanying movements (Mitbewegungen) are absent. The syllable-repetitions which manifest themselves in the early stages of the disorder last just as long as a word with an equal number of syllables. It must be regarded as a late symptom which may be taken as evidence that the disorder is of long standing if the "interruption time" is very short, and the clonic repetitions very rapid. There then follows a stage in which tonic manifestations appear at first in association with the earlier clonic repetitions, so that every repeated articulatory movement (as well as the analogous movements of the vocal cords in vowel-formation) is executed with excessive effort. There may at this stage be retardation of/

of the speed of the repetitions. During this period either the clonic or tonic component may predominate. Upon this symptomatological phase there supervenes a third stage which is marked by three characteristic phenomena: first, the accelerated clonic repetitions already mentioned, second, the appearance of a distinct pause or halt after the clonic or tonic movement of the speech mechanism; and lastly, but most easily observed, the appearance of the interpolated words or syllables ("Embolophrasien") which the stutterer so frequently employs when difficulty in speaking arises. The final stage is the phase of "masked stuttering" to which Froschels applies the term "Kaschieren". The disorder is such that it may sometimes be detected only by the initiated, although the sufferer may still be aware of such acute distress in the attempts to speak that he is unable to see the person whom he is addressing. Apart from a certain postural stiffness or rigidity, and some small physical movements which are very often not at all obvious, along with on some occasions a short period of apparently silent reflection before speech, the overt symptoms may reveal nothing out of the ordinary. In some cases this last stage precedes the complete disappearance of the disorder, and may indeed occur in this way in the course/

course of treatment. But it cannot be looked upon as the certain precursor of recovery. The general tendency of this progress of the disorder, which can be traced according to Froschels only in developmental, and not in traumatic stuttering, is clear. The stut-terer, who is at first mastered by the disability, gradually achieves some degree of control over his disordered speech, so that the more violent expressions of the disturbance may be very considerably diminished. It is readily com-prehensible that the degree to which the later stages of this development, which is throughout conditioned by the stut-terer's attempt to make the best of an inferior in-strument of expression, is attained is in large measure dependent, as Froschels has suggested upon the intellect-ual and cultural level of the individual sufferer.

As we have seen, the principal defect of Denhardt's theory, is that it fails at the point where nearly all interpretations of stuttering have come to grief, namely, in the attempt to make clear why the disorder ever arose in the first instance, and still more emphatically to ex-plain why the disorder that did arise was stuttering and not some other neuro-muscular inco-ordination. In order to explain/

explain the mode of operation of the various external factors which may very well be directly influential in the production of a functional disorder of this kind, it is not enough that we should postulate a vaguely conceived psychoneurotic disposition, nor justifiable that we should imagine a much too specifically conceived process of hereditary transmission. The latter in most cases cannot be proved and the former does not account for the specific form in which the disorder makes its appearance; it does not tell us why the child stutters instead of suffering from enuresis. It might be possible to arrive at the required explanation by having recourse to the analytic theory of fixation and regression. But if we take this line in dealing with stuttering, the fact that it is a disorder of speech becomes secondary and incidental, if not negligible. For Hoepfner, however, as the name "associative aphasia" implies, stuttering remains pre-eminently a speech-disability, however much it may be necessary for us to take into consideration other aspects of the stutterer's activity and of his psychological make-up/

He has endeavoured to trace the psychological development which would run parallel to a series of symptomatological phases which corresponds, for the most part, to that which has been elaborated by Froschels and to demonstrate how, around the nucleus of a disturbance of co-ordination which is not itself affective in origin, a hysterical syndrome is gradually developed.

Stuttering is a disorder conditioned by speech but, so far as can be ascertained, there is no specific defect traceable to any of the components of speech as these have been analytically described in the classical theories of aphasia. The relations of the auditory images of the stutterer to his visual tactual and other sensory impressions is intact. In the beginning the disturbance is characterised by the clonic repetition of sounds or syllables. Apparently Hoepfner is of the opinion that this originates in a type of ataxic inco-ordination, which is especially likely to make its appearance during the period of the rapid acquisition of vocabulary by the child. Comparable unsatisfactorily co-ordinated movements ~~which~~ are to be observed in the child who is learning to walk, but who is as yet incapable of mobilising in a unified activity adapted to the purpose of the moment/

moment all the simultaneous impulses proceeding from the brain. In dealing with the difficulty that arises at this point, Hoepfuer is more than a little obscure. Clearly since anomalous movements of the kind to which he ascribes aetiological significance must occur in the speech-development of every child if they occur at all, these movements cannot in themselves be regarded as the source of the stuttering-disorder. Hoepfuer himself states the problem thus: "Since we know from anamnesis that a specific and painful stuttering very often arises as a result of purely repetitive ataxic speech, is the ability to recall these occurrences to be held to be alone responsible for it, or must we look further for another explanation. Is there a material origin, a defect of transmission which is to be assumed as its ground"?

He argues that such an anomaly of conduction cannot be demonstrated on the basis of modern neurological thought. But assuming a psychological make-up peculiarly predisposed thereto - the disposition consisting apparently in a defective self-consciousness - he thinks it possible that there arises an unusual awareness of and an abnormal attention to the anomalous articulatory movements which have already appeared/

This fundamental assumption is the crux of Hoepfner's interpretation, and the part of the theory which will be most difficult of general acceptance. If it could be proved the rest of the theory in great part follows immediately. It is probable that it would also supply a satisfactory explanation of most of the ascertained facts and significant phenomena in the disorder. Some difficulty of interpretation might arise over the question of the regularly formed preponderance of male over female stutterers, but it is not yet certain that this demands a special explanation which would go beyond the broader biological differentiation as regards variability which exists between the sexes. But Hoepfner has not made clear in what the initial psychological differentia of the stutterer consists in order that the realisation of a not unusual maladaptation of the speech-movements should have for him, at a very early stage indeed in his development, this special determinative significance. The occurrence of spasmodic movements is not in itself determined by affective factors, although these latter condition the length of time of the contraction in such movements. The origin of the disorder, according to Hoepfner, is associative, since it is induced especially/



especially by the associated consciousness that the speaker is going to have difficulty.

The original faulty co-ordination in some of the movements of speech, combined with the awareness of its occurrence, and a lowered capacity of psychic resistance, forms the ground upon which the later developmental sequence in the progressive establishment of the disorder is erected. So far, at least, as the mere activity of vocalisation and articulation is concerned, speech is not differentiated from mechanical skills of a lower order, except in that the neuromuscular co-ordinations which it requires reach an unusually high degree of complexity. In its motor aspect it is characterised like them by an increasing degree of automatism as skill is gradually acquired, and it is like them in that it cannot reach a high level of perfection until the necessary movements are carried out unwittingly, until a stage is reached when attention to the movements to be executed produces a greater or less degree of inco-ordination in the activity as a whole. In walking, for example, if we attend to every step, we shall certainly walk awkwardly and make the slower progress. This, in Hoepfuer's opinion, is what happens in stuttering. In the ordinary flow of conversational/

conversational speech, slight momentary defects of co-ordination seldom reach awareness, since they form part of a motor process which with increasing familiarity has lost any conscious character it may have had at an earlier stage. The early motor inco-ordinations of speech normally disappear with the progressive fixations of clear verbal images and the development of speech. But they may persist for a long time, whereupon confusion and feelings of irritation may arise. When these diminish sufficiently to allow the child to turn his attention to his speech, he attempts a reconstruction of the verbal expressions which reach his consciousness distorted by the primary speech ataxias, a sensory component being added in this way to what is primarily a disorder of motor speech. In speech, as in any other form of skill, attention is ordinarily concentrated, not upon the various stages of the mechanical action, but upon the goal or intention of the performer, in this case the expression or communication of certain thoughts or feelings. The kinaesthetic, and even the much more important auditory images, are disregarded while we attend to the meaning of the words. In the stutterer all this is reversed. He turns his attention upon the movements of articulation, as we may observe in the naive/

naive attempts of the child to deal with the primary incoordinated movements by an increase of impulsive energy. It follows naturally that the faulty co-ordinations become only the more pronounced. During the attempt at speech the words on which stuttering occurs lose their conceptual significance for the speaker and are degraded to the level of mere sound-constructions.

Stuttering is the outcome of an association which is of such a kind as to produce new and peculiar conditions of adaptation, especially if, as Hoepfner maintains, the psychological organisation of the stutterer is characteristically defective in its capacity for resistance. Hoepfner seems to be of opinion that, apart from the actual manifestations of the disorder, the stutterer's voluntary control of speech is naturally erratic and unstable. There is a psychological development in his reaction to the disability, which conditions the overt manifestations that appear at different stages. From the early naive consciousness that "there is something wrong" in connection with his speech the stutterer comes only gradually to the stage of assertion of "I cannot", which has been called by Hoepfner the/

the "moral-psychopathic" phase. In this final development the speech-disorder becomes the centre of a properly hysterical syndrome, in which there are present a high degree of auto- and hetero-suggestibility as regards the stuttering itself, a manifest anxiety, and a continuous disturbance of the stutterer's judgment of value of reason of his intensified feeling states.

6) Stuttering as the result of Transient Auditory Amnesia (Bluemel).

Much more closely related to the classical doctrine of aphasia is Bluemel's proposition that the basis of the stutterer's intermittent difficulty is transient auditory amnesia, the failure of the auditory verbal images to appear when they are most required. The interpretation is developed at great length upon a foundation of structural, sensationist psychology, and a now quite untenable ideomotor theory of the mental antecedents of normal speech. It is supported by a negligible amount of experimental evidence, which is itself poor in quality, and subjected to forced and, even in the small part of it that he has published, frequently quite erroneous interpretations. Apart from this, it depends upon an equally false interpretation of the phenomena of stuttering speech which he has only superficially observed, many of them being/

being developed manifestations which represent not the original or essential disorder, but the attempt of the stutterer to make the best of the defective instrument which he has at his command.

The psycho-physiological theory which Bluemel has elaborated re-assembles, frequently in their crudest form, the conceptions regarding cerebral function and the elements of language, considered in its psychological aspect, of Bastian and the diagram-makers. "The verbal image", he says, "is paramount in determining the nature of the words expressed; hence if no clear-cut verbal image is in the mind, no word can be orally produced. It is no more possible for the speech-organs to produce a word that is not clearly expressed in verbal imagery than it is possible for a gramophone to produce words that are not present on the record. The gramophone reproduces words as they are spoken into it; the speech organs reproduce words as they are dictated by the verbal imagery. The verbal imagery is absolute." He goes so far as to reduce the psychological elements of speech to images of the sounds of the phonetic or physiological alphabet/

alphabet each of which, by implication, must have its representative in the cells of the cortex. If, as Head has suggested, the sentence became in the older theories of aphasia not the expression of a developing psychological process, but a word heap, in Bluemel's interpretation of stuttering the word itself becomes a jumble of concatenated phonemes.

Stuttering is a functional form of auditory aphasia which is capable of psychological interpretation, although Bluemel does not rule out altogether the possibility of minor organic lesions and deliberately introduces physiological factors as probable conditions of the disorder. But the primary fact is that in certain circumstances the stutterer fails to retain command of the auditory verbal images upon which he is ordinarily dependent in oral expression. The normal speaker is in general an "audito-moteur" as regards the type of verbal imagery upon which he relies in ordinary speech. The stutterer, belongs naturally to the same class, with this difference that in the press of speech his auditory imagery disappears, or else is only tardily responsive to the demands that are made upon it. But if this were a true description of what really does happen in stuttering the temporary condition and the nature of its manifestations/

manifestations ought to be much more like those of the actual auditory aphasia (jarjona^ophasia) in which, in the opinion of Bluemel himself, the auditory imagery is obliterated by organic lesion within the limits of the cerebral area for auditory speech. The principal function of the auditory image in actual speech is the regulation of the more delicate movements that produce the vowels. The stutterer should therefore experience the greatest difficulty in production of the vowels, and the distortions of his speech should be such as to indicate this. According to Bluemel this is what we find.

The most obvious manifestations of stuttering are the tendencies to prolong or to repeat the initial sound of a word. If the stutterer prolongs the initial continuous consonant, or repeats continuously an initial explosive he cannot, it is argued, have any difficulty in articulating a consonant which he thus overproduces. Wyllie and Bastian had asserted from their physiological point of view, that the stuttering disorder arises from lagging action on the part of the mechanism of the larynx, so that the core of the difficulty is in vocalisation, and not in articulation or phonation. Bluemel agrees with the general terms of this conclusion although/

although he does not admit that the stutterer's difficulty is in the production of voice per se, but rather in recalling the sound-image of the vowel in the word he wishes to enunciate. If the initial consonant is produced to excess, either by way of prolongation or repetition, that is the result solely of delay in the appearance of the vowel. As soon as an auditory image of the vowel, sufficiently clear for utterance, appears the continuous articulation stops. But the contingency might very well be reversed, and it is dependent, as it stands, upon the uncertain opinion that all the phenomena of stuttering - which are not spasms, since they can be brought to a stop at will - are voluntarily produced. Bluemel finds no significant differentiation between the diverse manifestations of the disorder except in so far as he, ~~probably~~ ^{perhaps} correctly, regards the various muscular contortions and disturbances of breathing which he considers under the rubric, "physical stammering (stuttering)", as secondary developments. Disregarding, because he has not noticed ^{it}, the fact that the disturbance has its own course of development, he is able to indicate as the simplest form of stuttering that particular manifestation which consists in the occurrence of a pause between/

between the initial consonant and the following vowel; the pause, of course, being occasioned by the speaker's inability to reintegrate the necessary auditory image." But this is in fact a late and highly developed form of the disorder, which appears only after the stutterer has succeeded partially or altogether in suppressing its more violent manifestations. Nor is it by any means simple. Apart from the fact that this type of stuttering does not appear at the outset in young children, closer consideration, in the light of his own theory, of examples of the kind that he himself cites might have suggested to Bluemel that the symptom reveals that the disorder is of relatively long standing. He quotes from Kussmaul's account of the speech of his old nurse "who spoke somewhat as follows: "K-h-ommen Sie endlich? Der K-h-affee ist schon etw-h-as k-h-ait". The appearance after the stop-consonant of the intrusive aspirate indicates the presence of a fairly severe, probably spasmodic, disturbance of respiration which would be, according to Bluemel, secondarily developed.

The essential fact in this interpretation of the disorder is not simply that the auditory images fails the stutterer/

stutterer in the critical moment of speech, but that, being an "audito-moteur" he has learnt to rely upon those images for the guidance of oral expression. If he had been an "articulo-moteur", completely restricted to kinaesthetic imagery from the beginning, he could not have fallen a victim to the disorder. Bluemel finds support for this assertion in the statement, which is borne out by the findings of some other investigators, that stuttering never appears amongst the congenitally deaf, who have been taught to speak and who should be dependent for speech upon kinaesthetic cues. But consideration of the asserted facts in this connection indicates an essential weakness in any interpretation of stuttering based upon any form of imagery-theory. There is not the slightest reason to believe that the kinaesthetic imagery upon which the "articulo-moteur" and the speaking deaf subject are supposed to depend has conferred upon it some peculiar invulnerability by contrast with the auditory imagery of the "audito-moteur" even although, as Bluemel argues, the general function of motor response is established phylogenetically at a very early stage in organisenic development. On the contrary, if Bluemel's theory of transient auditory amnesia has any foundation/

foundation in fact, it is to be presumed that the verbal kinaesthetic imagery in these individuals should be subject to the same functional disturbances and amnesias, induced probably by very similar causes, as the auditory imagery of the others. If this were so it is at least conceivable that, even if such kinaesthetic amnesias would not give rise to stuttering, they should be the ground of a corresponding functional disorder which would show points of contrast with stuttering analogous to those which exist between so-called auditory aphasia, and those other aphasic disorders which, as Bluemel would argue, are dependent upon lesions within a circumscribed "kinaesthetic centre." But nothing of this kind has been demonstrated. Further, if stuttering were dependent in this way upon an even transient auditory amnesia, we should expect that it would show much more obvious points of objective correspondence than it does with actual auditory aphasia, resulting from organic injury to the so-called auditory centre, such that the auditory images must be specifically annihilated. Although vague resemblances may be traced between stuttering and the aphasic disorders in general, it is difficult to point to specific analogies with the manifestations of one or/

or other of the older divisions of them, and one at least of Bluemel's significant criteria of comparison with auditory aphasia cannot be substantiated. His assertion that in some cases of stuttering the impairment of the auditory imagery is sufficiently severe to entail a mild degree of word-deafness is grounded upon a misinterpretation of certain obvious facts. The opinion is based, on the one hand, upon actual mishearing by the stutterer of what is said to him, and on the other, upon what Denhardt calls, in a passage quoted by Bluemel, "a certain tardiness of perception." It remains to be shown that either of these can be more frequently observed in stutterers than in normal speakers. But even if they were so, they can both be traced with greater certainty to the emotional disturbance of attention which is apparent in situations where stuttering occurs than to any temporary or permanent deficiency in the auditory imagery. More frequently the so-called "tardiness of perception" can only be established by a false interpretation of the period of silence which may intervene before the stutterer can utter a verbal response, and during which there may be little or no overt manifestation of speech-disorder or distress.

But whatever the relation between stuttering and organically conditioned aphasia - and it has yet to be shown conclusively that any relationship exists - it is scarcely to be expected that/

that a type of interpretation which, in both its psychological and its physiological aspects, in its cruder forms at least, has proved to be untenable as a basis of explanation for the major organic disorders of speech, will be found satisfactory for the functional disorder of stuttering. Bluemel's theory is based upon an implicit misunderstanding of the nature of spoken language, from the psychological point of view, and an explicit misconception of the psychological processes which precede the voluntary act of speech. The former is the outcome of an outworn psychological atomism, and the latter the re-statement of the ideo-motor theory of volition as applied to oral expression. Underlying the whole of Bluemel's theory of stuttering, as it does that of many of the writers on the subject, is the radically false conception of the spoken word as built up out of the various elementary sounds which constitute the phonetic or the physiological alphabet. The various topographically distinct areas of the cortex ought not to be considered by him, as they are by the still prevalent theory, as loci of "memories of words" or "verbal images" in which, as the conception is described by Head, the after-effects of past experiences are stored up ----- like photographic plates or ----as stamped upon the cells of the brain as the impressions of a seal upon wax." Although the orthodoxy of his creed is unimpeachable as regards localisation, and the ~~mnemonic~~ mnemonic function of the cerebral centres, the theory to which he subscribes carries analysis a step further, apparently

in the belief that the garnered images and memories are not even memories of words, but of the isolated vowel and consonantal sounds of which these are made up. But if, as Hughlings Jackson long ago pointed out, the sentence must be considered as a unit, and not as a string of isolated words, still less can the word be looked upon as a concatenation of vowels and consonants, represented in consciousness (and in the cortex) by the separate but associated auditory and kin-aesthetic images which underlie and determine the appropriate movements of articulation and vocalisation. It is no more possible to assume a point to point correspondence between the mental imagery, of whatever kind, and the constituent sounds of the spoken word than it is to conceive of such a correlation between physiological processes and the elementary constituents of an act of speech. If it were so, we should all know a great deal more about the sounds of our mother-tongue than any of us without specific education can claim to do. The child, in acquiring command over spoken language, does not begin by "learning" the sounds recognised by the International Phonetic Association, so far as they apply to his native speech. His early cooings and babblings are as complex, in respect of articulation and vocalisation and neuromuscular/

muscular co-ordination, as the more obvious movements which precede walking and running. In the sound-play of the early months, the child may even be so ill-advised, from the point of view of the student of development, if not of the proud mother, to articulate words he has heard, which are, however, here degraded to the level of mere sounds and can not be considered as the vehicle of expression. His earliest sounds are rudimentary rather than elementary, if by the latter term we mean that they are, or even consist of the constituent particles which will be later combined to give the words of every day speech. They are a fluid matrix from which much will be later dropped into oblivion, while that which is selected and retained will be broken up, redistributed, and combined with new and more highly co-ordinated sound-formations accepted from the environment, the whole being gradually shaped and moulded under environmental influence into fully developed language. This is a bad beginning for the imaginal control of speech, and it is followed up. We all remain in large measure completely unaware of the greater number of the sounds which are part and parcel of our utterance a hundred times a day, and here, as the efforts of the stuttering speaker show, the maxim "Where ignorance is bliss -----" has a very real significance/

At a later stage we learn to read irregular and unphonetic English spelling, and the little that we do know, and any images we may have had, become distorted and confused by the erroneous belief that we are really uttering what the symbols of the conventional alphabet imply." The habitual pronunciation is associated in the mind with the familiar eye-picture of the literary printed spelling so closely that it is difficult for the speaker to believe that he is not uttering the written sounds; but he is not competent to judge his own speech -----I was shocked when I discovered my own delusions in such matters". So Robert Bridges, but few of us ever attain to this pitch of self-awareness in the matter of our speech.

But without further consideration of the exact nature and condition of our uncertain, fugitive, diminished, and distorted images of the words and sounds of common speech, it is patent that neither the speech act nor the psychological processes preceding and underlying it can be analysed or atomised in such a way that resultant elements or their aggregate will represent what really takes place in the moment of utterance. Introspective scrutiny of the current of/

of speech fails where and in exactly like manner as similar analysis of the stream of thought falls short. It reveals the succession of events as a series of "stills", some of which may on occasion be entirely absent - the prior conception of what we want to say or of what we want to speak about, the selection of convenient terms of expression, and the final externalisation in words and phrases. It regards the "transitive parts", and enhances with a false distinctness certain moments which never attain actual clarity of definition before being subsumed in the final expression. "An act of speech", in the words of Head's description, comes into being and dies away again as an alteration in the balance of psychophysical processes; a state, never strictly definable merges into another inseparable from it in time". Elsewhere he says : "We neither think nor speak in combinations of verbal units ----- We cannot ever assume that a sentence is strictly a unit of speech. Speech, like walking is an act of progression. It is impossible to obtain a satisfactory conception of how a man walks from a single instantaneous photograph; before we can give the impression of a motion, the picture must pass in an unbroken series through a cinematograph". And yet again, in a passage which is of the highest significance in the consideration/

consideration of stuttering:^{*} "An act of speech is a march of events" - the metaphor preserves strikingly the simile of the previous passage - "Where one changing condition passes insensibly into another.

When speech is defective this easy motion or transition is impeded ; one state cannot flow into another because of some mechanical imperfection in the process". "An act of progression", " a march of events" - this is the true conception of the act of speech, whether it is considered in respect of its minor, subjective aspect, or with an eye for its overt manifestation in oral expression.

Introspection enables us to trace only the point to point progress of formulation, where any such occurs, *in* the act of speech. It fails to register the subtler psychological processes - the momentary halts and turns and twists of thought, the regressions, the skipped hiatuses, the swift transitions. It can make nothing of the commonest of all occasions when thought and its expression become one, when thought is expression, and there is no analysable psychological process prior to the act of speech itself. Pursued upon a psychological background of sensationalist and associationist doctrine, it provides us with a disintegrated collection of elements amongst which, even/

even when they have all been present as parts or movements in the activity preceding speech, it is scarcely ever possible to find the actual determinant of utterance.

In the attempt to elucidate the relation of expression to the thought expressed three cases have been distinguished.

1. The first of these is of most common occurrence. Here expression cannot be separated from thought. The thought comes to consciousness only as it is spoken. This is the typical formula of ordinary conversational speech, in which little or no attention is given to the words spoken and still less to the sound of them. There need not here be the vaguest foreshadowing of what is to be said, except in so far as that may have been supplied by the immediately preceding remark of our interlocutor. Even this will be wanting in those situations in which, as Pillsbury has indicated, the only incentive to speech is the need to say something.

2. In this case both thought and expression may be fully developed before utterance. Such a procedure is possible only under rarely occurring conditions, in which a much longer time than is usual may be spent in the prior formulation of what is to be spoken.

3. Speech in the third case lags a little behind thought, or more accurately, thought runs ahead of speech in much the same/

same fashion as the eye travels ahead of the voice in reading aloud. This will occur, usually during a discourse of some length, when the speaker endeavours to divide his attention between the sentence actually being spoken at the moment, and that which is to follow immediately.

In the first of these no detectable mental process, and in particular no sort of imaginal representation of the actual words to be used, precedes speech. If there is an ideational or conceptual foreshadowing of what is to come, this need be only of the vaguest and most indefinite kind. All ordinary, informal speech comes about in this way.

In the second, of which the "prepared speech" or the formal repetition of a passage previously learnt by heart are typical examples, the process of expression may fall within the category of ideo-motor action. The effort of the speaker is here concentrated primarily upon keeping firmly before consciousness the previously prepared form of expression and, since "thinking" is not demanded at the moment of utterance, a greater or less degree of attention may be directed upon the mechanical aspect of articulation and sound-production. But the imagery in which the set phrases/

phrases and prepared sentences are preserved will vary in kind from individual to individual and may, even here, be wholly absent. The kind of imagery employed will depend, not only upon the preferred type for the individual concerned, but in part upon the way in which the preparation has been carried out. Differences will occur according as it has been possible beforehand to run over the intended utterances aloud, or according as the material has been read aloud or silently in learning by heart. In the latter event, the imagery by which repetition is guided, except on the crudest of ideo-motor theories, may very well be a visual representation of the written or printed page. But the natural tendency, when the material has become at all familiar, is for the imagery of one kind or another to appear only when difficulty in reproduction has occurred as a consequence of the failure of automatic recall.

The last of our three cases is that in which thought may seem to be in greater or less degree in advance of expression. Under such conditions the actual speaking must go forward for the most part automatically, and in general without the appearance in consciousness of anything that could be described as an image. Vivid imagery especially if it is of the auditory or kinaesthetic type, of the terms of the anticipated sentence, is/

is likely to hinder rather than to help, to interfere rather than to facilitate. Reports have been recorded by public speakers who found the verbal imagery of the coming sentences so intense as to give rise to continual apprehension lest the words should break through amongst those actually being uttered at the moment.

It is manifest from these and other like considerations that there is no close or necessary connection between normal speech and any type of imagery whatsoever. Even on the rather rare occasions of formal or slow speech when imagery may be unequivocally present, the image is not necessarily verbal, or such that it can be said to represent in auditory or kin-aesthetic terms the sounds or motor processes of speech. When the topic is not completely abstract, the presiding image may be a visual representation of the object spoken about. Speech cannot be considered, any more than any other directed activity of the human subject simply as a process of reproduction imaginal or other, automatically carried out under the guidance and in consequence of certain previously formed associations, once the train has been released by the turning-on of a switch which has been dignified with the title of the "fiat". For if it were, even the polite nothings of tea-table conversation, or the random reminiscences of the impractical after-dinner speaker would be even more rambling and incoherent than they commonly are/

"Sticking to the point" would be an impossibility, and the ravings of the lunatic would become the rule and not the exception. What, then, is the determinant of expression of a particular thought, in a particular way, at a particular time? Is it, perhaps, that there is no single and isolable primary agent or causa efficiens? Frequently in conversation and sometimes to our dismay, we find ourselves compelled to contribute to a line of thought which is quite unfamiliar to us and to express opinions which we have never previously conceived. An exactly similar situation arises in the slower and more formal process of writing upon a particular topic in those moments when we are suddenly taken unawares by a novel issue or aspect of the general "subject" upon which we had believed our considerations to be fully worked out before we began. On these and like occasions, occurring either in speech or writing, the degree of coherence and consistency of the final expression cannot be the outcome of the running-off of a pre-formed chain of associations since, ex hypothesi, none such exists. The psychological process that has taken place can be best interpreted in terms of the Gestalt Psychology, and in the light of some of the findings of the Wurzburg school. In both cases we start from a general intention to speak or write, and/

and this prior volition cannot be broken up into a series of minor "fiats" for each of the separate words or even for the more or less complete "thoughts" or sentences. Although in speech, and to a lesser degree in writing, expression is conditioned by other momentary and sometimes highly variable determinations, it is primarily determined by this general intention directed upon some specific topic, however vaguely conceived, by the whole which is existent with a greater or less degree of definition before it is developed and "ejected". This in no way commits us to Wundt's theory that the development of the sentence in preparation for speech most often consists on the analysis of a prior complete notion or formulatory total idea. All that it implies is that the ultimate expression is only the final stage in or the outcome of a process which can best be described according to the Gestalt formula as the developing organisation under the varying pressure of different stresses of a total dynamic field. In more concrete terms, the words I utter and the apparently highly specific but perhaps previously unknown associations between them are determined by (1) my general intention to deliver myself upon a certain topic; (2) my actual situation at the moment, which includes my audience and my relations with them; and (3) my own past history, immediate or/

or remote and consisting of the possession or lack of specific knowledge capable of application to the matter in hand, the stage of development of my thought upon and my general attitude towards this and related topics. In such a conception of the act of speech or expression the neat schematisation of the structural psychologist has splashed and lost its form. Clear regressive analysis, from one point to the next, of the speech-act is ^{not} possible and imagery, on the few occasions when it is present at all in normal fully-developed speech, has lost its dynamic value and has had even its directive significance whittled away to a minimum. When we return, after this excursion into the psychological problems of normal speech, to Bluemel's interpretation of stuttering it may well seem that any theory of the disorder which is built upon the hypothesis of a deficiency, whether permanent or transitory, in the verbal imagery of the stuttering subject, is unlikely to carry us very far towards an understanding of the problems involved. Moreover, the essential basis of the disorder is asserted to be a transient auditory amnesia, we are compelled to look beyond the amnesia itself in order to find the ultimate source of the disorder of speech in the factors which work together to bring about the/

the temporary evanescence of the auditory imagery. Bluemel appears to be of opinion that the auditory imagery of the stutterer is either characteristically or congenitally (sic) weak, and the more liable in consequence to be adversely affected by deleterious influences from without, or else that it has become so as a result of extraneous influences - violent shock, febrile disease, and the like - of sufficient severity to reduce even normal imagery to a perilous minimum intensity. But he cannot be considered to have succeeded in demonstrating that stuttering arises in either of those ways. He concludes on the doubtful basis of the introspective responses of a small number of adult stutterers to a questionnaire intended to expose the nature and condition of their auditory imagery, that stutterers do manifest the deficiency which would support his theory of the disorder. But even if these conclusions were true and valid, the results have little or no bearing upon the problem of stuttering. Imagery of all kinds notoriously loses its concrete, detailed, vivid character with the advancing age of the individual. But stuttering is pre-eminently a disorder of childhood, and the responses of Bluemel's subjects afford no ground for conclusions regarding their imagery during the early years of life. Secondly, the connection between the onset of stuttering/

stuttering and causes of the kind suggested above is not only difficult to establish, but it appears also, in those cases where it rises above the level of mere possibility, to be most easily explicable in terms of the temporary general condition of the nervous system, without consideration of imagery of any kind. Thirdly, it has been shown that some of the conditions under which stuttering may be temporarily increased may be accompanied by an actual intensification or increase in imagery. During extreme fatigue, for example, images acquire sometimes a hallucinatory vividness, but under the same conditions stuttering is apt to become temporarily more severe.

In an attempt to account for the intermittent and transitory appearances of the deficiency in the auditory imagery of the stutterer, Bleumel has recourse to a physiological theory which was enunciated for the first time some fifty years ago. In 1883 Coen put forward the suggestion that the speech of the stutterer, and although less frequently, of the normal speaker also, becomes defective under the influence of intense emotion as a consequence of sudden disturbance of the circulation of the blood. In emotion, he argued, there is a sudden rush of blood from the surface of the body to the heart and minor organs generally, including the/

the brain. The resulting cerebral congestion is such as to produce temporary functional disturbance in the action of the central nervous system. In the stutterer this is apparent in his disordered and irregular breathing which is than taken to be the proximate cause of the difficulty in speaking. Ruff, in 1885, localised a similar hypothetical disorder in the cerebral centre for speech. The speech-disturbance is supposed to arise on the first occasion from a sudden expansion or contraction of the blood-vessels of this centre which, after this initial disorder induced by a lesion, a shock, or an emotion of unusual intensity, is apparently the more susceptible to a renewal of the attack. In recent years two experimental investigations have been reported by S.D. Robbins of Boston which have a direct bearing upon these speculations. In ten cases of stuttering, nine of whom were adults, Robbins found vasoconstriction of the peripheral organs during stuttering and during emotional shock. The vasoconstriction was even greater during stuttering than in some kinds of emotional shock. The amount of vasoconstriction and the length of time taken in the re-establishment of normal equilibrium appeared to be in direct proportion to the severity of the stuttering. Under similar conditions of peripheral/

peripheral vasoconstriction Robbins found that a normal speaker was unable to utter a word. From the study of normal speakers, Robbins concluded that the vasoconstriction which always accompanied stuttering was not caused by reading or speaking in themselves, but by stuttering. The peripheral vasoconstriction indicated a degree of cerebral congestion which might, Robbins considered, blur imagery, especially the auditory verbal imagery, to such an extent that it became impossible for the stutterers or for the normal speaker to talk for the time being. He reports also a further plethysmographic study of a trephined stutterer in whom the speech-disorder has been established many years before the occurrence of the bullet-wound which necessitated the operation. In this case every period of stuttering showed a marked increase in brain-volume, accompanied by a slightly increased pulse-rate. The increase in intercranial pressure which occurred during free speech was considerably less than it was during severe stuttering. Robbins concludes once more that this increase in brain-volume is an important factor in the production of stuttering.

The conclusions which Robbins based upon, the results of his first series of experiments indicate the ground of connection which Bluemel has suggested between these physiological findings and his own theory of stuttering. Upon the basis of Mosso's experiments on blood-distribution under different conditions, he considers that the transient amnesia

amnesia which causes stuttering may result from a temporary cerebral hyperaemia or anaemia, which has its effects upon the (in the subject predisposed to stuttering) peculiarly vulnerable auditory-verbal centre so that auditory imagery is "inhibited". Mosso's results had emphasised the increase in the cerebral blood-supply correlated with an accelerated pulse-rate during intellectual activity. Present even during attention, these phenomena became enormously more pronounced under conditions of fear. Bluemel is conditioned by his parti pris in his application of these results to the problem of stuttering. It might have seemed reasonable, considering stuttering as some form of fear-neurosis, to suppose that this very marked circulatory afflux in the internal organs during fear allowed us some insight into the physiological mechanism of a properly psychologically conditioned disorder. But for Bluemel fear is only one of the collateral or mediate causes of stuttering which primarily takes its rise elsewhere. As one of the most important of these, however, it may aggravate enormously the severity of a particular attack by its directly inhibitory influence upon the organs of articulation, and by its accompanying cerebral hyperaemia by which the amnesia will/

will be, as it were, over-determined. In general, however, Bluemel appears to consider that a degree of cerebral congestion, such as may be induced by the mere presence of another person and the greater effort of attention required for conversation, or by greater intellectual activity of any kind, will be enough to produce auditory amnesia with resultant stuttering. Whether the stutterer is differentiated from the normal speaker by an exaggeration of this response of the circulatory system, to a slight stimulus, or whether a normal increase in cerebral irrigation under these conditions produces abnormal results as a result of pre-existing abnormal cerebral conditions is not made clear. Bluemel argues further that mental imagery is most likely to be obscured when the subject is affected by intense emotion, when cerebral congestion is likely to be greatest. But it may be objected that some intense emotions, aroused in the very moment of social contact when stuttering is most likely to be apparent, induce not peripheral vasoconstriction but contrariwise a very marked peripheral vaso-dilatation, to which the flushed face and general physical discomfort of the subject bear eloquent witness.

If/

If it be argued that in such cases the speech-disorder, if there is any, is induced by cerebral anaemia, it is pertinent to ask why under conditions of intense emotion which have been held responsible for either of these peculiarly significant disturbances of the cerebral vascular system, both stuttering and aphasic subjects experience on occasion unusual freedom of utterance.

Before we finally bring to ^{an end} ~~aid~~ our consideration of Bluemel's theory of "transient auditory amnesia", it may be well to recapitulate the main grounds of objection to it. These are as follows:

- (1) It is constructed upon the basis of a crude and untenable theory of ideo-motor action.
- (2) It implies an entire misconception of normal speech and of the psychological processes underlying voluntary expression. This misconception is the outcome of an analytic theory which falsifies the facts, even when it is not guilty of misconstruing the results of its own analysis.
- (3) In normal speech imagery, ~~does~~ not play anything like the part which is by implication imputed to it on Bluemel's theory of stuttering.
- (4) Even if it were as important as Bluemel supposes it to be, it has not been proved that there is any significant difference between stutterers and normal speakers in respect of the nature and condition of their imagery. Moreover, stuttering arises in the majority of cases in early childhood, at a time when by general agreement concrete imagery of all kinds is more vivid than it is at any later stage. It has not been proved that the stuttering child, as distinct from the stuttering adult,

(4) cont.

adult, shows any defect of auditory imagery.

- (5) Even if it were true that transient auditory amnesia might be the proximate cause of stuttering, it is necessary to push investigation still further back in order to arrive at the ultimate ground of the disorder.
- (6) Even if cerebral congestion could be proved to be an invariable concomitant of stuttering, it cannot be assumed that it is the cause of the speech-disorder. The occurrence of cerebral hyperaemia under other conditions suggests that once again an accessory symptom of the disorder has been selected as its cause. Moreover, the stutterer is able sometimes to speak freely under conditions in which cerebral congestion may be aggravated considerably.
- (7) Stuttering as a result of the failure of synergic functioning at different levels of the bilaterally organised nervous system. (Sachs, Trairs).

Although it takes into account contemporary theory regarding the action of the central nervous system in the regulation of speech and the control of the mechanism of articulation, the neuro-physiological interpretation of stuttering advanced by Sachs of Wien, and extended and elaborated by Dr. L.E. Trairs, does not attempt specifically to relate the speech-disturbance or its phenomena to the ascertained facts of aphasia. They propose an explanation based rather upon the relation presumed to exist between the functioning of the nervous system/

system and its bilateral structure. In consideration of the supposed rivalry between the opposed halves of the cerebrum, stuttering has been compared by Sachs with squinting as an "anomaly of bilaterality", and designated by him a "competition phenomenon" (Wettstreitphanomen)

The theory starts out from the two fundamental positions: first, that cerebral control of normal speech is strictly unilateral; and secondly, that the cerebral mechanisms of language and of speech control are set up within the process of development of the individual. The cerebral regulation of speech is one expression of the directive function of the so-called superior hemisphere, or of that half of the brain which controls the preferred or skilful hand and foot. But even this degree of localisation, although it may have some basis in inherited predisposition, is fully established only at the end of an unobstructed process of maturation and development under the influence of external stimulation. But different factors may interfere with this development in such a way as to prevent its satisfactory completion, or to over-throw the organisation after it has been apparently satisfactorily established.

The first hint that the left half of the brain might differ/

differ functionally from the right was contained in Broca's epoch-making pronouncement in Paris in 1865 when he collated his accumulated observations of cases of aphasic disorder in the Bic^être Hospital. These observations pointed strongly to the conclusion that the function of articulate speech is discharged by one of the cerebral hemispheres, and not by the two acting together. Broca was able to show that for all the finer manipulations the majority of mankind are right-handed and therefore left-brained and he suggested that were probably left-brained also for the finely coordinated movements of speech. "Just as we direct the movements of writing, of drawing, of embroidery, etc., with the left hemisphere, so we speak with the left hemisphere". Broca's opinion did not find ready acceptance by his medical contemporaries. A priori, it seemed very improbable that the two anatomically symmetrical halves of the brain should be physiologically so asymmetrical as to have a most important function discharged by one side only, especially when the bilateral normal connections and muscular movements of the organs of speech were taken into consideration. But subsequent research has in this matter served only to confirm Broca's position, which has not been overturned even by/

by the leaders of the sceptical revolt against definite cerebral localisation of the language function, Pierre Marie and Henry Head. Despite the prevalent opinion, precariously supported by a too hasty acceptance of the conclusions of Franz and Lashley from their work on the lower animals, that none of the older localisations can now be maintained, the function of language appears still to be asymmetrically connected with only one of the cerebral hemispheres. In the great majority of cases lesions which involve disorder of speech and language are localised in the left hemisphere. This was adequately demonstrated by the cases of brain injury which occurred during the War. In left-handed individuals, motor predominance is governed by the right hemisphere, and it has been commonly observed that they are right-brained for speech also. But exceptional cases have been observed where aphasia occurred as the result of a lesion localised in the right hemisphere in apparently right-handed individuals, and after a lesion in the left hemisphere of left-handed individuals. These findings, although they have been very rarely reported, suggest that the connection between language-control and the integrity of the left hemisphere in the right-handed subject, and the reversal of this situation in the left-handed subject, may not be necessary or inevitable. But they do not contradict/

contradict the general statement that the movements of speech are unilaterally initiated and directed. It is necessary for our immediate purpose to trespass further upon the highly debateable ground of more specific localisation of function, and we may permit ourselves, if the need arises and as a matter of convenience, to make use of the terms "speech-centre" and "speech-area" without thereby committing ourselves to the dogma of any faction.

If the asymmetry of organisation of the nervous system is a real fact, and if it extends to the cerebral control of the mechanism of speech, several stubborn problems at once present themselves. The first of these centres round the question of the origin of the asymmetry in the course of individual development. Ballard has stated the dilemma as it appears in the case of the left-handed child" . Was it, as Plato thought, and modern advocates of ambidexterity teach, a mere matter of accident or training that the left hand started to gain an advantage over the right? And did the left-hand then educate the right hemisphere, and the right hemisphere transmit the advantage to the left foot? or was the left-handed child born with the right, cerebral hemisphere/

hemisphere slightly different in structure and function from the left? "Some of the specific attempts to answer these questions will be considered in connection with the experimental results to be reported at a later stage. Ballard himself concludes that modern physiology favours the latter view, and considers that the basal fact of sinistrality or dextrality is to be found in congenital cerebral asymmetry. The second problem arises from the fact of the double neuro-anatomical connections of the organs of speech, traceable to both hemispheres. Taking these into account, along with the fact that the movements of speech are not executed on one side only, like the movements of a trained right hand, the nature of the functional asymmetry. becomes the more obscure and difficult to conceive. Further, and as an extension of the last, there arises the problem of what takes place in the opposite and apparently subordinate hemisphere in the acquisition of language and the development of speech control. Is specialisation of function so rigid and complete that, so far as language is concerned, the right hemisphere of the righthanded individual, the left hemisphere/

hemisphere of the left-handed individual, is completely inactive? Or is the subordinate hemisphere a sleeping-partner which can take over control, when need arises, if not at a moment's notice, at least after a longer or shorter period of learning, or perhaps merely "warming up to the unaccustomed business? Or is there even within the language function itself, as Hughlings Jackson suggested, a measure of division of labour between the hemispheres? Or is there, perhaps, a more complex relationship between them of controlling and being controlled, within which each will have its own part in the activity of speech? The theories of stuttering which we are now to consider both carry the implication of an affirmative answer to the last of these questions.

The theory of Sachs is intended to provide an explanation for some of the facts in the clinical observation of stuttering which have from time to time been asserted by himself and other investigators. The first of these, which Sachs corroborates on the evidence of his own findings, is the frequent occurrence of stuttering in left-handed persons. Secondly, he instances the still more striking cases of war-stuttering in which the speech-disorder arose after the wounded soldier had been compelled as a result of injury to the right hand or arm to/

to acquire new skills with the left. Thirdly, he cites a case of stuttering which improved after a stroke resulting in right-sided hemiplegia.

He sets out upon his elucidation of stuttering from the discrepancy, which has already been noticed, that speech which is manifestly a bilateral-symmetrical performance is controlled from a unilateral centre. The hearing of speech precedes by a long time the first attempt at utterance, but its development is not related to one hemisphere more than the other. Further, aphasia in children disproportionate~~ly~~ often arises as a result of a lesion localised in the right half of the brain, and not solely from one on the left. These facts, he considers, may be taken as an indication of the relatively late development of the preponderantly one-sided innervation of the speech-movements. Similarly the greater vulnerability of speech in childhood suggests a still incomplete process of localisation. when this is considered along with the admittedly greater recoverability of speech-disorders during the early years of life. When restitution of function occurs after a lesion which was accompanied by loss of speech, this will as a general rule result not from the recovery of the injured cerebral area/

area, but from the employment of the corresponding area in the opposite hemisphere. If this is so, the new development of speech will not be required to begin ab ovo .

Ordinarily in the course of development right-handedness is instituted of necessity in order to break down the bilateral-symmetrical control of arm and hand movements, thereby making possible the combination of different movements of both upper extremities. But the innervation of the vocal organs from one hemisphere which accompanies right-handedness does not provide a basis for different executive functions in the speech-centres of the opposite hemispheres. Instead, the corresponding area in the opposite hemisphere is suppressed. In all cases in which the un questioned supremacy of one hemisphere has not been established stuttering may arise. The phenomena of repetitive stuttering indicate that impulses which are equal in both hemispheres follow each other separated by a short interval and, interfering with each other, reveal their bilateral origin. The frequent appearance of stuttering in left-handed individuals is, therefore, not unexpected since in them the natural predisposition towards left-handedness or towards a right-sided cerebral supremacy is paralleled by the/

the favouring of right-handedness, or a left-sided supremacy, under the influence of the environment and of education. Sachs finds support for his theory in the appearance of stuttering in cases of aphasia which are on the way to recovery. In them the speech-disorder is supposed to arise during the period of growing importance of the originally suppressed speech-centre while the functioning of the injured side is pari passu eliminated.

Sachs believes that stuttering as an "anomaly of bilaterality" is comparable at certain points with phenomena which manifest themselves in binocular vision, in particular with squinting and the occurrence of retinal rivalry. The phenomena of reveal an antagonism in visual perception when different stimuli are applied to the two retinas similar to that ^{which} occurs as the result of impulses coming from corresponding parts of the cortex. Alternating currents of low frequency give interrupted visual sensations, while currents of high frequency lead to fusion of the afferent impulses so that a continuous sensation results. In normal speech, in which the bilateral movements are asymmetrically controlled, Sachs discerns a victory of function over the (bilateral-symmetrical) structure of the brain. In squinting, the function /

function is under the control of the bilateral-symmetrical arrangement of the sensori-motor apparatus of the two eyes, so that here, as in stuttering, function is subordinated to structure.

Travis's more elaborate exposition of an interpretation which is exactly similar in all its essentials to that of Sachs has been evolved upon a two-fold basis - on the one hand, the theory of the development and structure of the nervous system advanced by Herrick and in The Physiological Foundations of Behaviour by Child ; and on the other the neuro-anatomical theory of S.T. Orton. From the former he derives the conception of the nervous system as a dynamic equilibrium in which the organisation depends upon or consists in the finely co-ordinated relations of dominance and subordination existing between its separate parts. These relationships are the outcome of the addition of different levels of control at different phylogenetic stages. From Orton he borrows his conception of the speech-mechanism as being made up of what he calls "mid-line levers". The essential element in this conception is that homologous components of the physical organism, occurring in pairs on opposite sides of the mid-line - such as the hands, the feet, and most important, the cerebral hemispheres, differ structurally as being mirrored counterparts of one another. The antitropic/

antitropic condition is supposed to be carried over from structure to function. This is implied, for example, in the statement that mirror writing is the normal sinistral expression.

The vocal organs are in a peculiar position in such an explanatory scheme, concerned, as they are on any physiological theory, in dextral and sinistral asymmetry, generally accepted opinion, as already indicated believes that they are functionally connected with only one hemisphere although they are anatomically connected with both. The indications of aphasic disorder have been taken to show that they are normally controlled by the superior hemisphere, i.e. the hemisphere which initiates and directs the motor activity of the preferred side for the individual concerned. *Travis*, on the other hand, regards the speech mechanism as a single organ, practically and functionally, which is under the synarchic control of both hemispheres. "The speech-muscles on both sides of the mid-line", he says, "preset a situation comparable with that which would exist if the two arms or legs were required always to react in unison as single structures. There is set up, that is to say, a system of dual control in which, since ambivalent leadership by, or competition between the hemispheres may arise, the scene is set/

set for trouble in the form of disordered speech. In the normal individual speech is controlled, not from a topographically distinct centre, but by a dominant focal gradient which may perhaps vary from time to time but which in strictly right-handed individuals is to be found in the left hemisphere, and in strictly left-handed individuals in the right hemisphere.

The prerequisite for normal speech and for the satisfactory performances of other functions as well, such as reading and writing - is the establishment of such a dominant gradient in the superior hemisphere. The basis of stuttering is the lack of such a dominant gradient, or the diminution, for one reason or another, of its dominance. If this occurs, the corresponding gradient in the properly non-dominant hemisphere is free to take a hand in directing the performance, so that a real dual control of the vocal organs may arise. But this centre (to use the older terminology) is not only the mirror representative of the corresponding centres in the opposite hemisphere, but the two also function mirror-wise. The reaction-patterns which they initiate when functioning out of harmony in this way are, in Orton's phrase, opposite in sign, so that the speech/

speech mechanism must try to function in two opposed directions at the same time, or now in one direction, the one side of the brain being active, now in the other, the other side of the brain being active. Fundamentally, the failure of coordinated functioning must arise from a disturbance of the exact chronological sequence in a highly integrated activity where the time-relation is all-important. The peripheral manifestations of stuttering can be interpreted, as they have been by Sachs, as indicating competition in the muscular movements of speech which is the result of the supposed rivalry between the two sides of the brain. On the one hand, the persistent clonic and tonic speech-blocks reveal the simultaneous action of the two centres; on the other the tendency to prolonged inspiration with interrupted expiration, or the stutterer's attempts at speech during inspiration are indicators of the alternate innervations coming from the two hemispheres.

Orton has argued, in an article on "The Sight-Reading Method of Teaching Reading as a Source of Reading Disability" that the equal growth of the two halves of the brain implies equality of stimulation. The establishment of the supremacy of one or other hemisphere must then be the result of stimulation applied in/

in the presence of a prior inherent bias towards dominance. Now if this inherent bias is itself weak, or if external influences can interfere with its development or expression, the ambivalence in which Travis finds the origin of stuttering, and which Orton himself has suggested as the basis of mirror-reading will arise. Presumably, also, the degree^{k₀} which dominance is established will vary from one individual to another. If the developed margin is small it will be the more easily overthrown. Upon such a nervous organisation the plethora of agencies which have from time to time been put forward as inciting causes of stuttering - including the superficial traumatic factors which have certainly been accepted with a too ready facility by clinical investigators as the main if not the sole causes in the individual case, - will the more readily take effect. But such uncertain dominance will be found in general to be the result of three principal conditions, working together or in isolation.

- These are : (1) the already mentioned lack of inherent bias for its development, for which Travis seems to find dubious evidence in the presence of left-handed relatives in the family of the stutterer; injurious influences, of a kind that might occur in cases of difficult or instrumental birth, which may directly effect the cortex itself in such a way as to inhibit or retard development;
- (3) Indirect environmental interference with the development of a dominant gradient when the tendency to the establishment of a definite habitual physiological "sidedness" is checked or diverted. This will occur when the (by presupposition) innately left-handed individual is compelled/

compelled to suppress his natural inclinations in the interest of social conformity.

Several real or possible grounds of objection to this highly speculative neurophysiological interpretation of stuttering fall to be considered. It has been suggested that unilateral innervation of the vocal organs cannot be normally unilateral if they are to function symmetrically, if the action of the diaphragm, for example, is not to be lopsided and uneven. But the objection appears to rest upon a misconception. Even if the movements of the speech-mechanism are unilaterally directed from a dominant gradient or coordination centre or nodal focus of one kind or another in the superior hemisphere, this cannot be taken to mean that the action-currents in speech are necessarily also unilateral. In the interpretation of the stuttering-disorder proposed by Travis this is explicitly not the case since the vocal organs are asserted to be functionally as well as anatomically connected with both hemispheres. The fact that lesions in the non-dominant hemisphere commonly leave speech unimpaired is not an insuperable difficulty for such a theory. But it is possible also that the speech-mechanism does to some extent function asymmetrically even in the normal, or at least non-stuttering speaker. Whether asymmetrical pulmonary development has any bearing upon the point at issue, I do not know.

although it is of not infrequent occurrence. But an apparently insignificant observation noticed by Wyllie in The Disorders of Speech is here not without point. Wyllie there draws attention to the fact that the trilling motion of the tongue for the R-sound is not executed by the middle of the tip, but in most individuals by the tip at the right side of the mid-line. He considers that in this we have "an indication that the speech-energies are not distributed with absolute equality to the two sides of the tongue, but that the tongue in speech is to some extent "right-handed". He does not record any observations which would provide an answer to the interesting question whether left-handed persons trill with the left side of the tongue-tip. If this were true, it would suggest that the organs of speech themselves, despite their central position, are affected in a cruder and more obvious way in the one-sided development of motor preference.

It is perhaps a more obvious ground of objection to the theory, especially in the form propounded by Sachs that if stuttering is the expression of the incomplete supremacy of either hemisphere, and if such supremacy is of relatively late development as a result of a combined process of maturation and stimulation, then stuttering should be of much more frequent occurrence/

occurrence in children beginning to speak. Logically, indeed every child might be expected to stutter at the outset. The random spontaneous movements of the infant are generally bilateral as in the simultaneous waving of both arms, or the kicking of both legs at once. This observation considered along with the relatively late appearance of any definite manual preference, suggests that the specialisation of the functions of the hemispheres, or at least their release from simultaneous similar activity, occurs only after a certain stage of development has been reached. This would bear out the theory of the gradual development of one-sided physiological habit. But the speculations of Sachs regarding the origin of stuttering will be true only if, as may be, something in the nature of stuttering does occur much more frequently in infantile sound-production, if not speech, than is generally held. If any such "disorder" occurred it might very well escape observation. It might be over-come at a very early stage in the majority of cases by the speedy establishment of a sufficient degree of differentiation between the hemispheres. What will later be regarded if it persists, as a disorder, will easily pass unnoticed for what it really is in the preliminary trials of a still undeveloped function. In addition it is only after several months of spontaneous vocalisation that consonant sounds begin to appear in the child's /

child's babbling with the more complex co-ordination of the speech-mechanism which this implies. Furthermore, even in cases of chronic stuttering the earliest manifestations of the disorder are neither violent nor persistent, and in many cases the disturbance has probably been present for some time before the actual date of onset given by the mother. Mild motor inco-ordination in the functioning of the speech mechanism might therefore, be present in infantile sound production as the result of the temporary inadequacy of the supremacy of one hemisphere. But their relation to stuttering as such need not be apparent. If, however, we postulate, as Travis's theory does, an innately organised, sufficiently strong inherent bias in most persons towards the development of physiological predominance of one or other half of the brain, then this difficulty need not arise. If the dominant centre is given prior to development, or comes rapidly to relative maturity, speech-disorder need not arise.

The theory has been subjected to further adverse criticism on the ground that if the disorder of stuttering is physiologically conditioned in this way, then it ought to be accompanied by disturbance of other cortically regulated functions and activities as well. The significance of the objection is not clear. Head has pointed out/

out in his discussion of aphasia that any lesion gravely disturbing speech affects activities which are not usually classed with the use of language. Extended disturbance of this kind, arising from the patient's inability to command the linguistic formulae necessary for consecutive thinking cannot be demonstrated in the stutterer. On the other hand, Head calls attention to phenomena of a different kind which manifest themselves when the "vigilance" of the cortical centres is lowered by reason of cerebral lesion. Not only is the highly organised function which is primarily connected with the centre in question thrown into disorder, but in the failure of this highly integrated response, manifestations of a lower order may make their appearance. "Should inhibition or control of some lower neural activity be one of the normal results of integration in the higher "centre", the abnormal response may comprise positive manifestations due to release of this function". This is not actually of frequent occurrence in disorders of speech even when these are produced by lesions of the brain, the manifestations being chiefly of functional loss. Travis, arguing that stuttering is an indication of an alteration in cortical activity and control, has endeavoured to show on the basis of experimental findings which he presents, that something of the kind does occur in the stuttering subject at least during the actual period of disordered speech.

He finds that the response latency is markedly reduced during stuttering speech, whereas in normal speakers, speech has little or no effect upon the reflex time except for some slight increase by comparison with the times recorded during silence. He interprets the results as indicating a reduction in cortical control, and therefore in the subservience of the lower levels of the central nervous system during stuttering. In view of the small number of the cases from which he quotes, and the difficulty of accurate recording, his findings must be accepted with caution.

8. Stuttering as a Pathological Social Response (Appelt, Fletcher)

The complete failure of many centuries of endeavour to correlate stuttering with any consistent abnormality of anatomical structure, and the equally unsatisfactory results of efforts to connect the disorder with any constantly operative deficiency of physiological function have led inevitably to the attempt to find the source of the trouble in psychic factors, and the interpretation of it in psychological terms. Fletcher in a moment of unwarrantably optimistic valuation of the present position, has maintained that the history of stuttering indicates that progress in understanding the disorder has been in exact measure/

measure as we have left behind the organic and physiological conceptions of it and have approached the psychological and physiological interpretations of it. This transition implies the abandonment of the conception of stuttering as a defect of speech, if, as the theories which we are now to consider insist, "the defectiveness of utterance is but a symptom of the unhealthy mental and emotional attitudes which constitute its real pathology." In so far as the stutterer is able, under certain conditions or at certain times to speak without difficulty, the position appears to be logical. The true defects of speech, whether of organic or developmental origin, appear no matter what the situation in which the sufferer finds himself temporarily placed.

The theory of stuttering elaborated by Appelt, himself for many years a sufferer from the disorder, is founded upon the central interpretative principles of Adler's Individual psychology, that all forms of neurosis and developmental failure are expressions of inferiority and disappointment, and that the neurotic symptoms are themselves to be understood as purposeful or regarded as "weapons against a contemplated undertaking" . Although not himself an adherent of the analytic school of psychology, Scripture had preceded Appelt in the assertion that stuttering is a psychoneurosis of which the/

the essential characteristic is "the unconscious desire to avoid human society, and whose mechanism consists in using ridiculous speech as a means of attaining the desired isolation." "Stuttering is therefore, a diseased state of mind which arises from excessive timidity and shows itself in speech-peculiarities that tend towards a condition of segregation^{eg} which will enable the person to avoid occasions where he will suffer on account of "timidity". An essentially similar conception forms the core of Appelt's interpretation. Chronic stuttering is for him always the expression of the dread of life which has grown out of the feeling of personal failure and inferiority, the sense of inferiority being invariably the primary cause, and not simply a secondarily developed result of the disorder which might form a basis for its maintenance. Since the stutterer can read freely when he is alone, the source of the disorder, it is argued, is to be found in his attitude to others, and its aim in the desire for isolation from them. The logically extreme development of this attitude would be complete withdrawal, and its corresponding expression, dumbness, or a kind of hysterical aponia. In the centre of stammering (stuttering) stands the dread of speaking which inhibits the automatic process of the function. When dread causes the sensorium, particularly/

particularly the word-image centre to vibrate (sic), as especially when the stammerer's attention is directed to letters and words, emotion easily transfers itself to those motor channels which have become more or less irritable through constant stimuli from the sensorium. The voluntary movements of these nerves are therefore intensely influenced by dread".

The development of personality, according to Adler, is the outcome of the conveyance^{rgence} of the aims of individual self-assertion and of the social feelings which are of biological origin. Normality consists in the achievement of a socially acceptable and useful fusion and just proportion between the desire for dominance and the urge of the social instincts. The nervous character or neurotic personality is one in which such an adjustment of aims is not attained, when the will-to-power asserts itself at the expense of the social components. Such an individual tends typically to "arrange" his psychic life in accordance with his immoderate desire for power, and to reject the demands made upon him by others and the responsibilities imposed by society. "The neurotic automatically turns against allowing any community feeling to develop". Frustrated at an early stage in the attainment of the goal he has set for himself, the neurotic does not attempt to adjust his aims to the circumstances of his/
his/

his position, but takes refuge behind a nervous symptom of one kind or another. In face of a temporary difficulty, even the normal individual may display neurotic symptoms, if the circumstances of the moment give rise to mental conditions which, if they became permanently established, would form the basis of a neurotic character. In this way it is possible to interpret the occasional stuttering of the ordinarily normal speaker for "diplomatic" reasons, or when agitated or afraid as the expression of the same psychic conflict, the same failure in courage which lies in the background of chronic stuttering. In the former, however, the "retreat" from a threatening reality, of which the transitory disturbance of speech is the expression, is only temporary. The disorder becomes fixed when the individual comes to believe that by means of it he can avoid certain difficulties and make life easier by erecting a defensive barrier. Appelt, therefore, asserts that in the greater number of cases chronic stuttering makes its appearance as a "distress-signal" just after a change of circumstances. He instances as the most usual of such changes. The beginning of school life, changes of school or teacher, the/

the death of a favourite parent, the second marriage of the father or mother, or the birth of a younger brother or sister, resulting in the comparative neglect of the older child by the mother or nurse. To protect his sensitive sense of personality the nervous child will in such circumstances seek security in isolation which can be most effectively attained by refusal to speak. "Through stuttering the child who has not sufficient courage to "give out" to others is able to maintain a defensive distance between himself and the environment whose demands he fears" When he is alone or when he sings he need have no difficulty because neither situation calls for intercourse.

Appelt believes that three variously overlapping groups, each manifesting the appropriate character-traits, can be distinguished among stuttering subjects according to the use made by the individual sufferer of the neurotic symptom.

In the first of these, which contains by far the greatest number of the sufferers from the disorder, the protective stuttering is employed as a weapon of attack and defence because the individual is wanting in the courage to take a more straightforward or directly aggressive line in dealing with the demands of life. It becomes an expression of his deeply-rooted rebellious attitude towards those who are stronger than himself. Secondly the stuttering may be used as an exaggerated "Captivus benevolentiae". Feeling very strongly his own/

own incapacity, the child makes use of his illness in order to gain a prominence which he fears will be denied him, and to do justice to his own desire for importance and domination over his environment. In the third group, the disorder first makes its appearance at a later stage - according to Appelt between the ages of ten and sixteen - the immediate cause of failure being some serious blow to the patient's ambition. The hypersensitive but aggressive individuals who make up this class, will under such circumstances, retreat behind the neurotic defence-symptom.

The form and occurrence of the apparent phenomena of the disorder are supposed to lend support to the general thesis. "Stammerers", Appelt writes "without exception belong to the type of ambitious people who have been discouraged and have developed a style of life founded on their magnified sense of inferiority and directed to an increase in their sense of personality." Hesitation in speech is interpreted as being indicative of a general attitude of hesitation and uncertainty. He halts, becomes blocked in utterance, repeats letters and syllables, because of his dread of going forward which is the result of his feeling of ~~minor~~^{inner} inferiority and the self-protective tendency which leads him to overestimate the difficulty of his problems, and especially that of speech. It is to be noticed that Appelt, like Froschels, objects/

objects to the employment of the term "spasms" for many of the disturbances of articulation, vocalisation, or respiration which are apparent in stuttering, since he considers that many if not all of these repetitions, sudden inspirations and the like are voluntarily produced. As a means of psychological self-protection, the stuttering-disorder manifests a quasi-masochistic form of expression. Hence its greater severity when the stutterer is compelled to emerge from his isolation, for example, during oral-classwork in school. The reverse of this occurs for the same reason, since the stutterer ordinarily finds utterance easier in those situations where life has dealt most gently with him -at home rather than outside if he has not been thwarted or neglected there, or with his mother if he has had greater indulgence at her hands than from his father. The same picturesque explanation is advanced for the occasions when the stutterer endeavours to speak only after breath has been almost completely expired. Appelt goes so far as to suggest that the very letters with which the stutterer will find difficulty are psychically determined, qualitatively and quantitatively. He gives no evidence for this very dubious assertion beyond the indication that the associations at work are entirely individual ones, and can only be discovered from the patient's dreams. But the/

the great majority of investigators have failed to find any consistency in most cases in the sounds upon which stuttering occurs. When such localised stuttering occurs it is probably the result of an only partially successful effort on the part of the older stutterer to control the disorder. The principal phenomenon of stuttering has been described by some writers as a disturbance of co-ordination consisting in a failure of the opening muscles of the speech mechanism to prevail against the muscles of closure. Appelt translates this in terms of the Adlerian psychology by saying that all stutterers express at the same time "Yes" and "No". Just when he is about to speak, the feelings of inadequacy and fear assert themselves and he checks his utterance; in the very moment of advance, he calls a sudden halt and endeavours to retreat behind his protective barrier. The more the actual situation enhances the stutterer's feeling of inferiority, when he has to speak, for example, to some^{one} who is in a position of authority or superiority, real or imagined, the more he will make the effort to escape, and, in consequence, the more severely will he stutter.

Fletcher has raised objection to Appelt's interpretation on/

on the ground that a not inconsiderable percentage of stutterers have been geniuses or have reached achievement of a very high class. He implies that in such cases the inferiority-feeling which, according to Appelt, lies at the root of the disorder is inconceivable. But the criticism, in this form, will not stand, grounded as it is upon faulty logic in the handling of a defective psychology. The sense of inferiority would be an infinitely less serious problem than it is if it existed only in the presence of real grounds for it, and compensation, supposing the success of the cases in question to have taken this form, will not always provide an adequate solution of the individual problem, however admirable it may be. A compensation may only provide the desired satisfaction if it is accepted as such. It must, however, be allowed that Appelt has not made out his case. It remains to be proved that the sense of inferiority really exists prior to the onset of the disorder. The handling of the example of Demostheres, perhaps with dubious justification, in the literature of the individual psychology as a typical case of successful compensation for an inferiority which had a real source in an actual disorder of speech, suggests another interpretation.

interp^{ref}lation, which is probably more in keeping with the clinical facts. For that stuttering may become the basis of a very serious sense of inferiority cannot be denied, and the sufferer resorts not infrequently to compensatory activities, or even to over-compensations of a less desirable kind. In view of the difficulty of obtaining verification of the facts of such a theory at the early age at which the speech-disorder usually makes its appearance Appelt makes a judicious, but unsupported, assertion regarding the onset of stuttering. It does occur, although how often it is difficult to say, that the disorder vanishes for a period after making its first appearance. Some time later ^{according to the theory} the chronic form establishes itself with manifestations exactly similar in kind, but completely different in origin. Appelt argues that a considerable number of children stutter in their second or third year during the period of development of the speech-function. Such stuttering, which is liable to result from over-stimulation, is due, he maintains, simply to the technical difficulties of pronunciation and is not of pathological significance. Ordinarily it may be expected to disappear with practice and the increasing stabilisation of speech. He believes that chronic stuttering rarely develops directly out of this infantile form of the disorder, but supervenes in general at a later stage and after/

after a period during which the child has spoken normally. As Appelt gives no percentage of onset at different ages his exact position is not made clear. Although it is conceivable that some only of the children who begin to stutter become chronic stutterers, it is very uncertain whether ^{the} infantile stuttering that Appelt describes occurs in many cases in which the speech-disorder does not become established, if, indeed, it occurs at all. But unless this is substantiated, the cases showing a latent period in the development of the disturbance appear to be very rare. The theory, however, does not account at all for the appearance of stuttering as such, instead of any other neurotic symptom equally capable of providing a defence against the rude shocks of the working-day world, and of bolstering up the sufferer's feeling of inferiority. Characteristically, because of its interest in the "where to" rather than the "where from" of the neurosis, Adlerian theory provides us with a general if facile explanation of the neurotic symptoms, and in the case of stuttering, if the interpretation were true, with a satisfactory neuropathic diathesis out of which the specific neurosis might arise. But it fails to account for the form taken by the neurosis if and when it does develop.

Despite an explicit rejection of the Adlerian theory of the stuttering-disorder and an attempt to construct a fundamentally different interpretation of it, Fletcher's hypothesis reveals many points of contact with that which we have just been discussing. Emphasis is placed mainly upon the same phenomena in the manifestation of the disorder and the same mental characteristics are stressed, although Fletcher regards as merely symptomatic those factors which Appelt considers to be of aetiological significance. Both reject the conception of stuttering as a disorder of speech in the interest of one which considers it rather as the expression of a defect of personality. Introducing his volume of studies in Individual Psychology, Adler writes: "The Unconscious resolves itself for us chiefly into the neurotic patient's failure to understand his impulses in relation to his social environment." In spite of the difference of psychological background and context of the two theories, and the difference of elaboration which these imply, this fundamental principle is common to both. "By every rule of scientific induction", Fletcher says, "it seems to be established that a subtle form of emotional reaction, whose chief component is fear, which is set off by the/

the realisation of a certain social relationship existing between the speaker and his auditors, together with the possible unpleasant consequences of failure, must be held primarily responsible for stuttering."

Speech is to be regarded as a complex form of social reaction, and not merely as a vocal function, and its integrity depends upon the normality of all the responses involved in it. It is primarily a and the primary medium of communication, and since it is that, the utterance even of the normal speaker registers subtly from moment to moment in the form of expression, the selection of words, and more subtly in the tone of voice and the quality of the articulation, the influences of the immediate social environment. Apart from the specific intention of the speaker, expression will be modified by his knowledge of the habits and character of the listener by his attitude to the speaker and ^{by} the speaker's attitude to him. The disorderd speech of the stutterer is supposed by Fletcher to be the expression of an abnormality or exaggeration of certain of the psychological factors, especially the emotional attitudes, involved in this social adjustment. The central elements in the social response of the stutterer are "fear", anxiety, the feeling of inferiority, and kindred attitudes arising out of a state of mind engendered by the realisation of the necessity to meet, through speech, certain/social

social requirements." The fear is not the neurotic "free-floating anxiety" of the Freudian theory, but specific to the situation in which it and stuttering occur together. It is a morbid response, akin apparently to stage-fright, aroused by the demands and relationships of certain situations in which speech is required, and not by others. Not only is it a matter of common observation that the stutterer can sing, or read and recite when he is alone - that is, in both cases, when speech is not used as a medium of intercommunication - but he not infrequently achieves success in public as an orator. Fletcher even reports cases of sufferers who spoke satisfactorily as teachers before their school-classes, but began again to stutter immediately they returned to summer-school and resumed the role of student. In general, any situation in which the stutterer finds himself, the speech-disorder apart, in a position of inferiority, social or intellectual, is liable to induce an attack. In cases where he is in a position of superiority, or for one reason or another has his audience at his mercy, stuttering will tend to disappear. But still subtler manipulations or variations of the relations between the stutterer and his audience may make all the difference between free speech and a severe attack of the disorder/

disorder. Any lessening of seriousness or responsibility, or a reduction in the personal and intimate character of the social situation may facilitate speech, and the disorder may vanish when the auditors pay little or no attention, if the message is not important, or in mimicry or the playing of a part. Fletcher thinks that it is probably true that all stutterers suffer from inferiority complex. But he does not admit that the feeling is effective prior to the onset of the disorder, nor the realisation of a general inferiority. It is rather to be compared with the emotional reaction tendencies in so far as it is specific and aroused by a series of emotional experiences connected with the act of speaking.

Clearly the principal difficulty of the theory, apart from the fact that Fletcher presents few detailed particular observations in support of it, is to explain the primary origin of the disorder. In Fletcher's somewhat confused exposition of his interpretation, it is difficult to ascertain definitely what his position is on this most difficult point in the elucidation of stuttering. He asserts categorically, as part of his general antipathetic reaction to the analytic theory, that the disorder and the emotional abnormalities/

abnormalities which he admits as its accompaniments cannot be traced to any traumatic incident in the individual history, except in so far as these may provide a favourable neuropathic diathesis, out of which stuttering may or may not have arisen. "Stuttering is a specifically conditioned form of reaction-tendency" of which "the clinical characteristics will be determined more by immediately conditioning experiences than by any remote and predisposing factors of causation" It is differentiated from the simpler phobias by the fact that "the stutterer carries along w^oth him a constantly accumulating mass of associations of the very sort that, in connection with a favourable diathesis (inherited or acquired), are the sine qua non of the disorder". Mental or physical deficiency, in so far as they render social adjustment more difficult, will provide favourable conditions for the disturbance of speech, but commonly neither is present. While he does not admit a traumatic origin for the disorder, Fletcher maintains with equal emphasis that there are no constant anomalies of physiological function which are characteristic of the stutterer at times when he is not attacked by the disorder, and that the stuttering subject as a general rule manifests no psychological abnormalities which have not arisen in connection with or subsequent to the/

the onset of the disorder itself.

It is difficult to believe that Fletcher has not cut the roots from his own theory in this careless rapture of negation. If stuttering is gradually established by a process of cumulative conditioning, how and when did the conditioning begin? How did the most stubborn of the speech-disorders find a foot-hold at all in so many essentially normal individuals? Fletcher appears to offer a choice of solutions. He quotes Gray ("Behaviouristic Aspects of Speech Defects", *Jour. Speech Educ.*, X, 1924) who says: "Speech, then is a form of adjustment to social life. It is influenced not only by the habits which take place below the threshold of consciousness; whatever affects either of these factors, therefore, is bound to affect speech. The emotional conflicts which centre about the fundamental cravings and the social restrictions result in an upset of the normal reactions, and a speech-defect follows". Fletcher does not make clear how far he is willing to accept this statement of Gray's, although he accords it general approval. But if the speech-disorder is the outcome of conflict of this kind between the fundamental cravings (? instincts) and the external restrictions imposed upon them, then there must have been prior to the actual/

actual stuttering a psychological disturbance resulting either from the intractability of abnormally strong cravings (which in themselves need have nothing to do with speech) in face of normal obstacles to their satisfaction, or from the too great weight of restriction placed upon normal impulses by external circumstances or irrational demands. Gray, in a further quotation by Fletcher, admits this since "the real solution for the speech-disorder consists in putting these cravings to use, in sublimating them to the advancement and good of the social order."

Elsewhere Fletcher compares stuttering to the "expectation-neurosis" of Bleuler, and quotes his description as follows :

"Following one or more bad experiences in any kind of event (reading, writing, swallowing, urinating, after having been dazzled by a strong light, or surprised through a loud noise etc. into ~~into~~ infinity) the patient predisposed in this sense becomes dominated by the idea that he can no longer accomplish the function in question, or that he must suffer pain through it, and this idea becomes a reality. This results in paralysis of a definite complex of movements, or painful paraesthesia. Besides speech-stuttering which under conditions should be included in this category, one notes/

notes a number of other forms of "stuttering" (stuttering in walking, writing, urinating etc) -----

The expectation neurosis usually develops slower than the traumatic neurosis, to which it shows a certain resemblance, and also cannot be sharply differentiated from many hysterical syndromes -----".

It appears, then, that we are left with some sort of variant of the despised traumatic episode, or with the evidently accidental onset of the disorder in some chance occurrence. Fletcher sees the early development of language in the child as a process beset with many almost unavoidable inhibitions, which inevitably present the possibility of inducing emotionally toned response-tendencies. Except for a passing reference to the repression of bad language and knowledge of a socially forbidden kind as a source of the inhibitions in question, he is studiously vague regarding their origin, which is not to be found in any specific type of experience. Once the conditioned emotional response has been set up, it will become strengthened by repetition and an accumulation of associations will be built up to keep the stutterer's speech-inhibitions alive and active. Mistakes and inco-ordinated movements tend frequently/

frequently to occur in activities other than speech, such as type-writing, the writing of current script, and piano-playing, when the performer is under scrutiny. In the main, this is the result of a heightened "self-consciousness", which is properly a more or less painful awareness of the audience. Under such conditions the performer is apt to turn his attention upon the elementary movements of the mechanised process of motor skill to the detriment of the efficiency of the process as a whole. If stuttering were due solely to the operation of some such factor as this it would have to be regarded as a disturbance of the motor processes of speech in so far as they are carried out under the observation of others. But Fletcher strenuously insists that it is to be satisfactorily understood only if we consider it as a disorder of speech in so far as it is employed in social communication. The effort of will directed upon a process of motor skill will be the more likely to cause confusion if the process is still incompletely automatised, and to bring about permanent functional disorder if the primary disturbance is accompanied by severe embarrassment before a critical, or supposedly critical, observer. "When the asynergies are accompanied by strong emotional disturbances they are more likely to become fixed and pathological .

Pre-school/

Pre-school children, among whom we find the majority of cases of stuttering to originate afford just these conditions. Their language functions especially are in the formative stage, and the capacity to excite emotional response which words, both heard and uttered, have for them is unique". On Fletcher's theory, however, stuttering is differentiated from the common failures of co-ordination described above, or from the similar occurrences under conditions of stage-fright, in that he supposes that in the case of the speech-disorder, disturbance of function occurs at the outset at least, prior to the feelings of "self-consciousness", embarrassment, and fear which then result in an increase of volitional interference wrongly directed upon the movements of articulation. "A speech asynergy interrupts communication, where speech is being used for social intercourse - and it is only when speech is being thus used that stuttering ever arises - and hence may be a cause of embarrassment. Each experience of such an embarrassment in turn begets a tendency toward an increase of volitional interference. And so the vicious circle goes on with increasing strength."

The theory as it stands encounters two principal difficulties. In the first place, it seems possible, in/

in view of the facts of the aphasic disorders that the link between stuttering and the social situation which is the keystone of Fletcher's interpretation, may yet (if the mixed metaphor be permissible) be the weakest link in the chain. Head has pointed out that the utterance of the aphasic patient, even although the organic basis of the disorder makes perfect speech an impossibility, is still very delicately responsive to the circumstances in which he finds himself, and above all to those very conditions which are all-important on Fletcher's theory for the occurrence of stuttering. Like the stutterer, the aphasic frequently commands an unexpected facility and fluency of expression in moments of strong emotion, and like the chronic stutterer he can frequently swear freely - but surely not ^{solely} because in doing so he is able to express his feeling of superiority to his auditor. Yet even in the case of the aphasic both his power and mode of expression are profoundly affected by the relation of the patient to his auditor. We have already noticed the case reported by Bastian where the patient, who had only partially recovered his speech, was able to read aloud, when he was alone for some time before he could attempt the same performance in the presence of an other person. On this point/

point Head has a significant passage." One person can help an aphasic, whilst another produces an ~~inability~~^{inhibiting} effect, even on his capacity to think. We all adopt a different method of expressing ourselves to an adult or a child ----- So the intelligent aphasic adapts his defective speech to the necessities of the moment, although his power to execute such variations is greatly diminished. Success in making himself understood greatly increases his power of subsequent expression. Disappointment or anger may affect both the character and ease of his performance". In the light of these considerations it may appear more probable that, while the social situation or the relation between the stutterer and his auditor may be one of the most important factors in establishing the disorder and in conditioning the severity of a particular attack, it should not be regarded as the primary element in its causation.

Still more damaging to the whole conception is the consideration that it completely fails to explain why one child should stutter rather than another. If in the majority of cases there is no sort of prior basis, apart from the immaturity of the speech function, upon which it may take its rise, and if it is a response to no specific sort of external factor but either accidental, or the outcome of such inhibitions as must be at work during the early years of most children, it is difficult to see how all but a small percentage are so fortunate/

fortunate as to escape the disorder. The weakness of the interpretation is apparent when Fletcher attempts to account for the marked sex-difference in the incidence of stuttering. The point will be considered later in more detail. It is for the moment sufficient to notice that in order to explain the difference Fletcher finds it necessary to speculate upon the possible influence of factors which find no place in his main interpretation, such as anatomical and physiological differences between the sexes, the difference in attitude between boys and girls in the ordinary domestic environment, and the liability to exaggerated inhibitions in speech in boys in view of their generally greater freedom in the acquisition of illicit vocabulary and socially prohibited knowledge.

9. Stuttering as an Oral Neurosis (Coriat).

Generally expressed psychiatric opinion regards the disorder of stuttering as a regressive manifestation, but the individual psychiatrist is commonly no more willing than anyone else to explain in detail how the process has been instigated and conditioned. Nor have the recorded attempts at psycho-analytic treatment of the speech-disturbance by Brill and others met with any very marked degree of success. But as we have already seen, the complete failure of all the earlier/

earlier attempts to establish a somatic basis for the disorder suggested that the origin of the abnormality of function might be ultimately traceable to the psychological constitution or mental life of the individual. Here, if anywhere, there seemed to be a clear prima facie case for the effort to apply the principles of psychopathology proper. After several trial runs, each of which resulted in more or less of modification and elaboration of his original position, a thorough-going attempt at an elucidation of the disorder, from the standpoint of the Freudian school, has been made by Coriat.

Although the theory includes an interpretation of the most obvious disturbances of utterance, as such, which occur in stuttering, these are secondary manifestations in a conception which regards the disorder as an "oral neurosis" rather than a disturbance of speech. Such a conception rests upon two positions of fundamental significance. The first is the realisation that speech is, as it were, parasitic upon a number of organs, and a sensori-motor apparatus pre-existing for other purposes, principally feeding. The functional units of the mechanism of speech consist of the breathing, vocal, and articulatory apparatus. But it is to be/

be remembered that each of these plays a part in the other, and both phylogenetically and ontogenetically, older and more fundamental activities of the organism. Speech may be affected by injury to this apparatus, or by disturbance of its function in so far as it has been specialised for the execution of these other activities. Secondly, emphasis is placed upon the corollary assumption of the peculiar significance of the mouth in psycho-analytic theory. In his Three Contributions to the Theory of Sex, Freud has presented a sketch of the theory of the pregenital "organisations" of the libido, which has since then been considerably elaborated for the oral phase by Glover and Abraham. The general ground of the exposition is that the sexual or libidinal impulses of the child have to undergo a process of gradual development before he reaches the age of five when the period of latency sets in. During this development libidinal organisation passes through two principal phases or stages, at which the various partial impulses are attached to, and their satisfaction dependent upon, different erotogenic zones. If fixation or repression occurs at either of these stages, the oral or the anal-sadistic the scene will be set for the later neurosis. The first of the pregenital sexual organisations of the libido has been differentiated by Freud as the oral or cannibalistic stage. Here according to the theory, the sexual activity/

activity is not yet separated from that of the taking of nourishment. The aim of the one activity is also that of the other, namely the incorporating into one's own body of the object, the prototype of the later process of psychic identification. When the two activities become differentiated, and the infant begins to seek libidinal gratification apart from the satisfaction of hunger, thumb-sucking appears, in which the sexual activity is split off from the act of feeding.

In the application of these principles to the interpretation of stuttering Coriat is prodigal of theory and sparing of facts. In certain neuroses the character of the symptoms is determined by regression to a specific fixation point in the earlier libido-development of the individual. Psychological development is reversed and assumes the characteristics of an earlier, frequently infantile phase of development. If this happens the symptoms that arise will be typical manifestations of this earlier (pregenital) organisation of the libido." "A fragment of this early infantile sexual development is thrust into maturity producing a neurosis and modifying character by its persistence". In stuttering as in melancholia, the sufferer regresses to the earliest level/

level of all, the oral erotic stage, typically characterised by the two activities of sucking and biting. In it, as in thumb-sucking - which, according to Coriat, is significantly frequent in stutterers during early infancy and childhood - there is an innate tendency towards the re-animation of the earlier phase of the libido-development. Both are to be regarded as compulsive repetitions, unconsciously instigated because of the pleasure-principle involved. They are essentially variant forms of oral onanism. All stutterers are supposed to reproduce in their spasmodic tic-like speech-movements the oral reactions of nursing although retaining an earlier attempt at explanation - the disorder may be conditioned by an inner conflict or resistance against the expression of certain, usually sexual, trends of thought.

The actual oral manifestations of the disorder are interpreted in such a way as to lend colour to this theory that the stutterer is psychically anchored to the nursing stage of development, on the general principle that the repetitions and distortions which occur in his speech will be conditioned by the unconscious desire for oral gratification working, as it were, under subjection to a more or less severe resistance. Coriat calls attention to the fact/

fact that the labial sounds (p,b,m) which are generally said to be most difficult for the stutterer, that is, on which repetitive most commonly occurs are also amongst the earliest sounds which the child learns to utter. The special significance of these, from his point of view lies not in the mere fact that the child can pronounce them at a very early stage, but that he can do so, if Jespersen's highly probable supposition is correct, because the labial muscles used to produce these sounds, are the same that the baby has exercised in sucking the breast or the bottle. The mouth-movements involved in the stutterer's attempts at speech represent the persistence into maturity of the infantile activities of sucking and biting, so that here the regression may be observed, as it were in flagrante delicto, more clearly than in any other of the neuroses. Practically every stammerer (stutterer) ", Coriat says, "if the motor accompaniments of the attempts to speak are carefully observed, will be seen in the act of nursing, as shown by the sucking movements of the lips and tongue, the excessive flow of saliva, and the appearance of gratification when he is finally able to enunciate a difficult word. The mouth tongue and lips become overcharged with oral libido, which/

which the stammerer (stutterer) attempts to ab~~str~~^{re}act in speech, but at the same time, through an ambivalent tendency, also attempts to tenaciously retain the word, because of the pleasure principle involved in the difficult enunciation!"

Without prejudice for the moment to Coriat's general interpretation of the disorder, we may still consider some of his analogies in connection with its manifestations crude and fantastic in the extreme. The rhythmic character of the early sucking activity, for example, becomes the basis at once of the clonic repetitions of the stutterer's speech - whose principal character is that they are arrhythmical - of the periodic fluctuations in the severity of the disorder, and of the labile character-organisation of the sufferer from the neurosis. But the whole interpretation in so far as it attempts to deal with the actual speech-manifestations is vitiated by the over-valuation of the more violent phenomena which occur only as a stage in the development of the disorder, and probably not at all in many cases. Further, if Coriat's exposition were true, we should expect these more violent manifestations, the suckings and bitings which can be related to the early feeding-activities to occur predominately at the onset of the disorder although they might/

might be overcome later, as in general they are, by resistance. But in actual fact this is seldom, if ever the case, since they are ordinarily secondarily developed after a primary period of relatively mild clonic repetition. Nervousness or fear has been over-emphasised as the root-cause of stuttering, and is never a specific fear of speech as such. In an early article on the subject Coriat writes : "The only adequate explanation of stammering (stuttering) ----- is the psychogenetic one, namely that we are dealing with a form of anxiety-neurosis or anxiety hysteria which manifests itself mentally as morbid anxiety and a consequent dread of speaking, and physically as the usual somatic accompaniments of morbid anxiety with the added mental tic of the speech mechanism." The anxiety which the sufferer feels is an effect and not a cause, a reaction against the unknown source of the disorder itself. The oral libido has been repressed, and is now free to play an autonomous part when it can break through from its imprisonment in the unconscious. The fear which is displaced or projected on a specific word, or situation, or individual is in reality, and in accordance with orthodox analytic theory, the Ego's fear of the unconscious, or more particularly of the upward discharge of the repressed infantile libido.

It/

It follows, if stuttering is an oral neurosis that the stuttering subject will manifest those character-traits which the psycho-analysts have distinguished as typical of the oral-erotic psychical organisation. According to Coriat, this is what we find. "In fact, the whole stammering (stuttering) individual is built upon the oral stage of the libido, hence the importance of the oral character traits of the stammerer (stutterer)". He designates some half-dozen specific character-traits as typical of the stutterer. The pleasurable egoism of the suckling is reinstated in the pleasurable (sic) egoism of the stutterer. The oral movements, the repetition, and the increased phonetic concentration in utterance are the outcome of the pleasure-principle, and persist in the interests of the stutterer's narcissism. His attitude of omnipotence, if it exists, is almost as infantile as the egoism to which it is related. According to Coriat, it expresses itself in analysis as an over-valuation of ^{his} ~~their~~ intellectual attainments, ^{by the stutterer} and more specifically of speech itself. He finds corroborative evidence for this in the fact that stutterers in spite of their disorder manifest a strong desire to talk, or even a tendency to actual garrulity. Common observation would support Coriat in this/

this observation regarding this most surprising of the traits of the stuttering character. It is less certain that it would corroborate his assertion that stutterers are as a rule of an easy-going and labile disposition, although they are predominantly optimistic. Almost as unexpected as their garrulity is the fact that they are, except in individual cases, fundamentally bright and sociable, and in spite of their difficult speech, strongly "gregarious".

Direct confirmation or refutation of such a theory is manifestly impossible without actual analysis of cases of stuttering, but several incidental but significant points in the exposition are capable of verification by ordinary clinical methods. It is possible in case-taking to obtain some insight into factors which might have been at work, during the early months of life, to produce the fixation which is supposed to lie at the root of the disorder. Secondly, evidence is obtainable bearing upon Coriat's assertion that in a large number of cases, stutterers manifest a marked persistence, apart from the disorder itself, of activities such as thumb-sucking, primarily directed to perpetuate or to procure oral gratification. Thirdly, it is frequently easy to ascertain whether the stutterer reveals other neurotic reactions which are consistent with Coriat's explanation. Lastly/

Lastly, in the estimation of the character-traits of the stutterer, whether they are of pathological significance or not, it may be not without value to consider to what extent they can be brought within Coriat's scheme.

Coriat himself gives no figures in his monograph, Stammering: A Psycho-Analytic Interpretation which would indicate how many of his cases have yielded to analytic treatment with this theoretical background although he expresses himself pessimistically regarding the possibility of success in the individual case. But his exposition at least suggests one reason for the failure of previously recorded attempts to deal with stuttering by means of analysis, on account of which the disorder will remain highly resistant to analytic therapy. If his explanation of stuttering as a narcissistic oral neurosis which takes its rise at a point of fixation as far back in the individual history, be correct the application of analysis will always be difficult and its result extremely uncertain. It would require a much deeper and more prolonged analysis of every case than that which was apparently carried out by the early investigators from this point of view who expected to find the origin of the disorder in traumatic experiences of a more usual and more superficial kind.

The exposition has a real value, however, independent of its ultimate fate as an explanatory hypothesis, in so far as it directs attention to personal reactions which have been neglected even by the clinical psychologist, and to possibly significant traits which have been too often regarded as unimportant habits.

10. Retrospect.

Almost the only certainty that emerges from this survey of the contemporary position in regard to the theory of stuttering is that we are still far from the end of our quest for a satisfactory explanation of the disorder. No single theory is above criticism, although nearly all of them has been the foundation of or has been elaborated in the attempt to rationalise a therapeutic practice which has seldom failed to show some degree of success. But most of them raise more questions than they answer, and suggest lines of investigation amongst which, so great is the disagreement regarding the significance of the various phenomena, it is almost impossible to make a preliminary selection/

selection. The only point upon which there is any consensus of opinion is the negative assertion that the disturbance cannot be traced to any abnormality of the peripheral organs of speech or to any discoverable central lesion. Our problem, then, is to find an explanation for a disorder which is, by general consent, of functional origin, and here the divergence of emphasis and opinion is such as to render eclecticism impossible. There are signs that the psychologist has been no more able than the early observers to escape the temptation of conferring upon a secondary or relatively unimportant symptom an unwarranted primary significance, in such a way as to arrive at a false simplification of the problem. In these circumstances, hasty generalisation and premature dogmatising which have been the rule rather than the exception in considerations of the disorder are not likely to take us far towards a solution. We are properly committed then to an exact analysis of all the problems presented by the disorder, and to the attempt to elucidate these by any method of investigation, clinical or experimental, which can be brought to bear upon them.

II. THE PRESENT INVESTIGATION.

1. Summary Description of the Clinical Procedure.

The material which is to be considered here consists of the results of an investigation into the problem of stuttering carried out at the University Psychological Clinic in Edinburgh. Some time after it had been started the scope of the research was enlarged at the instance of the School Medical Officer for the city, so that it might cover the preliminary enquiry necessary before the institution of some scheme of treatment for the cases of the disorder occurring in the schools under the control of the Education Committee. In all upwards of one hundred cases were investigated, but the discussion is here limited, for the most part, to the results of examination of 78 consecutive cases all but one of whom were recommended by the School Medical Officer for Edinburgh. The earlier cases, examined before the problems at issue had properly clarified themselves, will be disregarded in this study unless they provide material to illustrate distinctly particular points. They /

They have not been considered in any of the statistical results, except for a few minor and quite separate matters, which will be noted as they occur, where it could not distort the general findings to include them. In the clinical investigation all of the cases were children between the ages of five and fifteen years.

An enquiry, which falls outside this clinical investigation and the following experimental research, was instituted with the concurrence of the various Medical Officers concerned, in order to ascertain the number of children known to stutter in the school system in the four principal Scottish cities, Edinburgh, Glasgow, Dundee, and Aberdeen, and in the five representative counties of Midlothian, Peebles, Wigtownshire, Ayrshire, and Fifeshire.

The clinical investigation included:

- (1) the obtaining, usually by interview with the mother, of an adequate history from birth onwards for every case. This part of the research and the psychological examination was in every case carried out by the writer.
- (2) a full medical examination, which was conducted by /

by the same person throughout the enquiry. In a few exceptional cases, a fuller psychiatric examination was carried out.

(3) the obtaining by means of a schedule of questions issued for every case to the appropriate class-teacher of corroborative evidence upon several of the problems raised by the psychological examination. The questions bore upon the child's scholastic progress, his achievement in the specific subjects of the school course (indication of definite retardation or special difficulty being asked for), and his attitude in and out of school. This information and the medical examination were obtained with the assistance of the School Medical Department. In view of an attitude of scepticism, if not of actual distrust, amongst the teachers, the value of the information obtained from them is somewhat diminished.

Apart from the obvious need, in the present state of our knowledge, for a full history of the child's development in every case - a need which is the more imperative inasmuch as it is as a result of inadequacy at this point that the mass of the medical and psychological literature of the subject falls short /

short - an attempt has been made to obtain information, as definite and unequivocal as possible, upon those specific points in that history which bear most directly upon the different interpretations which have already been discussed. The clinical and psychological examination was designed to elucidate the following points:

- (1) Are there traceable hereditary factors at work in the causation of the speech disorder: e.g., actual stuttering in earlier generations (apart from the parents of the case under examination, when the possibility of development of the disorder through imitation arises), or more deep-seated emotional or nervous instability which might have been the origin of a psychoneurotic predisposition in the stutterer?
- (2) Is there evidence for the assertion of inadequacy or uncertainty in the development of bilateral asymmetry, or "sidedness", in the neuro-muscular organisation of the stuttering individual? Information was sought regarding the "handedness" of other members of the stutterer's family, and specific tests of this trait administered in the case of the stutterer himself.
- (3) Is there a significant proportion of cases in which stuttering is associated with unusually difficult or instrumental birth?

(4) Is there any real evidence for the common assumption that stuttering arises in the individual case as a result of the traumatic occurrences (frights, accidents, etc.) in which clinicians are prone to find the origin of the disorder?

(5) In default of actual analysis, and apart from the speech disorder itself, are there any indications which might be regarded as supporting the analytic theory of oral fixation, e.g., difficulty in connection with feeding during the suckling period; unusual prolongation for one reason or another of breast- or bottle-feeding; unsatisfactory adaptation during the process of weaning; persistence of sucking and biting activities throughout childhood (thumb-sucking, nail-biting); other possibly neurotic difficulties arising during development, irregularities in the process of acquiring control of the functions of excretion, persistent nocturnal enuresis, etc.? It should be remembered that in an investigation of this kind where many of the subjects are young children, or indeed in any research which takes the form of a general survey without minute and prolonged study of each case, so that formal deep analysis is impossible, it is still possible to apply analytical principles. If we do, we find ourselves inevitably /

inevitably forced back upon a careful study of the early development of the child, and compelled to turn our attention to apparently minor factors which, whatever be their significance for the problem in hand, demand the consideration of and await explanation by the clinical psychologist. He cannot afford to treat in cavalier fashion habits like thumb-sucking which, however common they may be, are never insignificant to those, parents and others, who have the care of the child, and which may be the source of undeniable friction and developmental maladjustment. In clinical research, analytical principles, applied in this way, are likely in many cases to lead to results at least as valuable as those obtainable by methods of statistical comparison.

(6) Is there a "stuttering character" or personality? In particular, what has been the child's attitude

- (a) to the school-situation? Has he gone willingly from the outset? Does he show himself anxious and over-conscientious about his work for school?
- (b) at home? Is he (i) talkative or taciturn; (ii) aggressive with his brothers and sisters, especially those next above him and below him in age; (iii) docile and easily disciplined or rebellious and frequently punished; (iv) over-scrupulous and orderly; (v) strongly possessive, greedy or mean as regards his own belongings?

Here again, evaluation of the ascertained reactions and traits in the light of the discoveries of analytical psychology may be the only way of satisfactorily estimating the results obtained.

- (c) with other children outside the home? Is he (i) reclusive and unwilling to play, a "bad mixer"; (ii) quarrelsome; (iii) a leader or objectionably aggressive; (iv) timid or confident?

(7) Is the stuttering child typically excitable and anxious? Does he manifest marked specific fears, frequent nightmares and the like?

Further insight into the attitudes and reactions of the individual case was obtained by direct, though limited, examination of the child himself. In only a very small number of the cases was direct contact rendered practically impossible by the severity of the speech-disorder. Apart from the distress it may induce in some cases, examination of a stuttering child is indefinitely time-consuming by reason of the retardation of his responses. Not infrequently, however, the reverse may occur, and the child may from the outset speak freely under congenial clinical conditions. In addition specific tests of intelligence and of the stutterer's speech in different forms of oral expression were applied. Verbatim records were kept, in nearly every case, whenever stuttering occurred, of the child's responses under the following conditions:

- (a) in ordinary conversation.
- (b) in response to direct questions.
- (c) in reading aloud, alone but in the presence of the examiner, material of different degrees of difficulty.

- (d) in reading along with the examiner material well within the child's intellectual capacity and scholastic attainment.
- (e) in reading aloud when left entirely alone.

In every case an assessment of the child's intelligence was obtained by means of standardised (individual) tests. Tests in English were administered in as many as possible of the cases with a view to ascertaining whether the stuttering child tends to deviate markedly from the normal in his progress in the linguistic subjects of the school course. The Pressey X-0 Tests of temperament and character, or more specifically of emotionality, in the revised form prepared by Dr. Mary Collins, were also administered in these cases, attention being concentrated from the diagnostic point of view upon the last of the three tests, which is designed to expose the child's fears and feelings of anxiety (i).

In a clinical investigation of this kind the procedure must be adapted to the idiosyncrasies and special needs of the individual case, so that no hard and fast scheme could be followed from the outset. The number of interviews varied considerably. As many as six or seven might be required to carry through the complete series of tests, and in a few cases, where the speech-disorder /

- (i) The detailed analysis of the results of these tests is not reported in the present study.

speech-disorder was unusually severe, only a part of the intended programme could be carried out in that time. Only two or three interviews were required in some cases.

2. The Incidence of Stuttering in School-children.

Reliable statistics regarding the frequency of the stuttering disorder in children of school-age are difficult to obtain by the usual methods of rapid survey carried out on a large scale. The figures given below indicate clearly that in this matter the results of the routine school medical examination are quite valueless. Although only a certain number of children are examined medically in any one year it might be expected that the number of stutterers discovered in the course of such inspection would be representative, as is the case in respect of the common physical defects, of the proportion of cases to be found in the school-population as a whole. While this is by no means true of speech-defects generally, it is still more difficult, on account of the peculiar variability of the disorder, to trace by means of a cursory examination the stutterer who has not been previously reported as such. In an interview in which no response is required of him beyond a bare negative or affirmative, or at most the answers to /

to a few simple questions regarding his name, age, class, and so on, to which the responses have become almost linguistic "reflexes", even the child who five minutes before has been stuttering severely in the class-room may come off, so far as speech is concerned, with flying colours. Teachers' returns are likely to be more reliable. Few children who stutter elsewhere fail to do so in school so that here, the only factor tending to diminish the numbers reported, apart from a natural reaction on the part of the teacher against the filling-up of yet another form, is his subjective judgment of the degree of severity to be demanded in any speech-disorder before it becomes notifiable.

The figures recorded here have been obtained by courtesy of the Directors of Education and the School Medical Officers in the different areas, to whom a letter of enquiry was addressed asking for information on the following points:

- (1) the number of children in the school-system actually known to stutter, figures for boys and girls to be quoted separately if possible.
- (2) the total school population to which these figures refer, boys and girls being separated as before.
- (3) the basis of reply to the first of these questions, whether the results of the routine medical examinations, teachers' returns, or special survey.

The results of this enquiry are set out in Table I over. The first column gives the name of the area concerned; the second, headed "Basis of reply", the method of ascertainment of the number of stutterers reported. Where this was the annual medical examination, the word "Routine" is entered in the table with the years for which the figures were quoted. The third column shows the total number of children examined, or the total school population. In view of the varying form and different degrees of completeness of the replies, and the different methods of ascertainment, it is impossible to take the figures for the separate areas together.

TABLE I. (See page 160a).

In the light of our discussion, the only figures in the table which yield trustworthy information regarding the number of stutterers actually in the schools are those derived from the five special surveys in Edinburgh, Glasgow, Ayrshire, Fifeshire, and Wigtownshire. In the two cases where the results are reported both of the routine medical examination and of a special census of stutterers made by the teachers themselves the differences between the obtained percentages are striking. Taking the five reliable figures for the areas mentioned, we find that the percentage varies in these from .72 to 1.30, /

Area.	Basis of reply.	School-population or No. examined.	No. of Stutterers.	% Stutterers.	% Stutterers (Boys).	% Stutterers (Girls).	Proportion of Boys to Girls.
Edinburgh	(a) Routine 1928-31.	47,349		.13	.28	.04	7:1
	(b) Special Census (Teachers).	58,375	422	.72	-	-	-
Glasgow	(a) Routine 1924-31.	384,361	2060	.53	.86	.2	4.5:1
	(b) Special Census (Teachers).	183,409	1579	.87	-	-	-
Ayrshire	Special Census (Teachers).	50,000 (approx.)	369	.74	-	-	6:1
Fifeshire	Special Census (Teachers).	49,209	617	1.30	1.90	.60	3:1
Wigtownshire	Special Census (Teachers).	4,999	53	1.1	-	-	-
Midlothian and Peebles.	Routine 1925-32	40,676	103	.25	.45	.06	7.5:1
Dundee	Routine 1919-32	120,950	316	.26	-	-	-
Aberdeen	Routine 1910-32	155,180	615	.4	.6	.16	4:1

TABLE I.

Incidence of Stuttering in School-Children.

1.30, with the average in the region of .95 per cent. This figure agrees very well with the finding, generally obtained in surveys made in different parts of the world, that about 1.0 per cent of the school population are stutterers. In America Conradi found .87 per cent of stutterers in a census covering a school population of over 87,000. A similar survey of the schools in Boston, reported by Hartwell, gave the corresponding percentage as .78. Lindberg reports a Danish survey in which the children in rural and city schools were kept separate, the figures being .9 per cent for the one group, and .74 for the other. Rouma reports that 1.4 per cent of Belgian children are known to stutter, and the similar figure recorded by von Sarbo for Hungary is 1.02 per cent.

There is general agreement that all the common defects of speech occur with far greater frequency amongst the mentally deficient than amongst normal individuals. It is usually asserted also that the disorder of stuttering is present much more frequently in children attending schools and classes for the mentally defective than in normal children, but figures showing the relative incidence of the disorder in the two groups are seldom quoted. In the present investigation /

investigation separate figures for ordinary and special (M.D.) classes have been obtained from only one of the areas for which the statistics have been given in Table I. In Fifeshire the figures given in the teachers' returns for children in special (M.D.) classes are as follows:

Total No. of children.	No. of Stutterers.	% Stutterers.	% Stutterers (Boys).	% Stutterers (Girls).
168	7	4.2	3.74	5.00

No very detailed conclusions can be drawn from figures for such a small number of cases, but they support the common assertion that stuttering occurs more frequently amongst mentally retarded children. Even in this country, where the percentage of stutterers found amongst normal children is the highest of those quoted (1.30%), the corresponding figures for the defectives is fully three times as high. It is interesting, although it is impossible from such meagre data to say whether the fact has any significance, that, while the percentage of stutterers amongst defective boys is almost twice as high as that given for boys in the ordinary schools in the same area, the percentage for defective girls is eight times the corresponding figure for girls of normal intelligence.

Defects and disorders of all kinds are relatively more /

more frequent amongst defective children, and it is to be doubted whether the higher incidence of stuttering requires the attempts at ad hoc explanation which different theorists have put forward. Probably few of the suggested explanations are acceptable if the assertion that stuttering is more common also at the opposite end of the intelligence scale holds true. The fact of the higher incidence of stuttering amongst defectives in itself affords no support for any particular theory of the disorder, unless it be one which places the origin of the disturbance in some developmental defect or disturbance of cerebral function. But it must be emphatically stated in this connection that, even if stuttering is more frequent at the lower levels of intelligence, the conclusion cannot be converted and the manifestation of the disorder regarded as a stigma of mental defect. There is an accumulation of the clearest evidence to the contrary.

3. The Sex-difference in the Incidence of Stuttering.

A fact of which the significance is still in the highest degree uncertain is the generally established preponderance of the proportion of stuttering males over stuttering females. In the figures recorded in Table I the /

the proportions vary from three to one to as much as 7.5 to 1 in favour of the boys. In several of the areas, the routine method of examination employed is unlikely to yield results homogeneous with those which would have been obtained if the total number of stutters ascertained by a more careful survey had been taken into account. But we are left with reliable figures for the counties of Ayrshire and Fifeshire which give the proportions of stuttering boys to stuttering girls as 6 to 1 in the former area, and 3 to 1 in the latter. Proportions always in the same direction but varying from 2 to 1 for German children, reported by Fröschels, to 8 to 1 for the general adult population given by Coën, are recorded. Statistics regarding stuttering amongst adults are seldom reliable as they are most often simply a statement of the numbers presenting themselves for treatment. It seems probable that the number of stuttering boys as compared with that of girls lies somewhere between the figures of Fröschels and Coën quoted above, and in the region of four or five to one. It is conceivable that the numerical relationship between the groups might change with age in the direction indicated by Coën's findings if girls could be shown to manifest not only a less degree of susceptibility to the disorder, but also a greater recoverability after /

after it has been acquired. But it is also possible that the proportions might show a variation parallel with the known racial differences in the gross percentage of stutterers.

Divergent views of the theoretical significance of this difference between the sexes in susceptibility to the disorder have been expressed by different writers. Some have been disposed, like Fröschels, to consider the differentiation as simply another expression of the greater variational tendency of males over females, biologically considered - of the same tendency, that is to say, which manifests itself in the greater frequency in males of imbecility, genius, albinism, and of disorders and malformations of diverse kinds. If this interpretation were correct, then the difference in the number of stutterers in the two sexes would have no special significance for the interpretation of this disorder, but would itself require to wait upon a satisfactory explanation of the broader difference in variability.

The difference, however, appears to be too marked to be susceptible of any such general explanation, and it has been suggested that if it could be specifically elucidated the interpretation would take us far towards
a /

a true understanding of the disorder. Several of the explanations so far proposed, however, tremble on the edge of the absurd. Amongst these is Brill's conjecture that in the foraging and fighting of primitive man, as in the stress of present-day competition, strength and silence were desiderata, and speech a biological disadvantage. Women, in the seclusion of the home, might talk more freely with the result, presumably, that the mechanism of speech in them became more stabilised. But all of the theoretical explanations suggested are highly speculative. Knight Dunlap traces the development of stuttering to inhibitions aroused in the child in connection with his vocabulary of obscenity acquired outside the home. Boys are more likely than girls to suffer from such inhibitions since they have a richer obscene vocabulary and a more highly coloured argot than girls. But it is impossible to expose the inhibitions that are at work, as Dunlap suggests, by a consideration of the sounds upon which the child stutters supposedly on account of emotionally significant associations. Nor does there appear to be the slightest real ground for his assertion that the great majority of stutterers are "proper little boys" who are linguistically inhibited at home, whereas the guttersnipe who can /

can give free rein to all the vocabulary that he possesses seldom stutters. Fletcher, for whom stuttering is a social morbidity, a personal maladjustment, is discreetly vague upon a point which presents no little difficulty for his theory since it is by no means clear what external conditioning factors can alone be held responsible for such a marked differentiation between the sexes in a disorder which, in most cases, makes its appearance at a very early stage in individual development. Without admission of the inadequacy of the theory, he speculates independently of his main thesis and along lines not at all or only very partially in keeping with it: (1) that anatomical and physiological differences might be assumed to play some part in determining the speech-differences between the sexes; (2) that differences in the social attitude towards boys and girls, especially in the home where the boy is less likely to be emotionally adjusted, are likely to produce effects upon personality - a general statement with which no one need disagree, but one that casts only a dubious light upon the question at issue; (3) that the boy's wider contacts outside the home are liable to exaggerate inhibitions of the kind which are central in Dunlap's theory. In general emotional maladjustments of /

of a social character, with their resulting conflicts, are more likely to arise in boys.

The physiological hypothesis, advanced by Ssikorski and others that stuttering is less common in girls than in boys as a consequence of the more rapid development in the female of the motor centres of the left cerebral hemisphere seems in its crude form to have little more to commend it than any of the other explanations that have been put forward. But in this connection, and in the light of the theory that stuttering is an indication of inter-hemispherical competition, a suggestion proposed in a personal communication to the writer by Dr. Meade, the School Medical Officer in Ayrshire, is of interest. Arguing that the disturbance of speech in stuttering is undoubtedly of central origin and associated with the speech-centre in the brain, he considers it probable that this centre has been injured before or at birth. It may also be injured during birth since its localisation in the left lower frontal portion of the brain and neighbourhood lends itself to injury, especially when instrumental means are employed. If a superficial or cortical lesion occurs, the brain centre may recover its power of automatic phonation, but a predisposition to stuttering may remain.

Now /

Now male children generally have larger heads than female children and consequently are more likely to require instrumental help and to suffer potential pressure injury. The comparatively large size of head in the male child is the principal reason of the maternal mortality in the higher races and is much higher in proportion to the number of boys born than it is in the case of girls. The relative ratios are estimated by Fothergill as 1 to 79 in the case of the former, as against 1 to 159 in the latter. These striking figures would lead us to assume that the heads of male children are more likely to be subjected to abnormal influence during parturition in such a way as to account for the greater number of stuttering boys. The supposition finds support in the fact that stuttering appears to be relatively more frequent in nationalities where the cephalic index is high, and less frequent where it is low. In the brachycephalic population of Prussia and Poland the incidence of stuttering is high. In Spain, Portugal and Southern Italy, the cephalic index is low (72-77) and stuttering is less common. The Armenian Jews have an exceptionally high cephalic index (86-87), and are reported to show a very high incidence of the speech-disorder. Boome and Richardson quote the assertion /

assertion of the headmaster of a large Jewish school in London, where the racial origin of the pupils is extremely varied, that the disorder is almost twice as common amongst Jewish as it is amongst Christian children. It has been suggested that the moderate incidence of stuttering in Britain parallels the cephalic index, which is of the mesocephalic grade. If it could be shown in any one country, such as Britain, that stuttering children tend to show a cephalic index higher than the national average, the finding would lend significant support to the proposed explanation of the sex-difference in the ~~incidence~~-incidence of stuttering.

In this form, however, several objections may be urged against the theory. In the light of the modern conception of cerebral function in speech, it is very doubtful whether any such specifically localised innate centre is a prerequisite of the normal development of language. Moreover, no actual lesion has ever been proved to be present in cases of stuttering. But there is some evidence of a connection between abnormal foetal positions or difficult or instrumental birth and disturbance of speech. It is conceivable that in some cases these abnormal influences brought to bear either before or at birth upon the nervous organisation underlying /

underlying speech might result in some cases in disturbance without discoverable injury. In accordance with Travis' hypothesis, it might be supposed that the disorder or the predisposition in its favour was the result of interference with an innate tendency to the dominance of one or other hemisphere.

4. Age of Onset.

Few reliable studies have been published, and it is difficult to obtain accurate information regarding the age at which stuttering begins. Several writers have stated that more than eighty per cent of stuttering children begin to stutter before the start of formal schooling. In the light of his experience, Fletcher considers that this is a conservative estimate. Travis, however, says that "the most reliable surveys reveal that about 85 per cent of stutterers begin to stutter before eight years of age". Fröschels states that stuttering, or as he calls it, associative aphasia, may first make its appearance either at an early stage in the development of speech, in the third or fourth year of life, or at the beginning of the school period, or even at puberty or a later age, but he gives no figures or percentages in amplification of these assertions. Several sources of error make accurate statement difficult upon the point at issue. /

issue. Stuttering for all that has been said to the contrary, seldom appears with catastrophic suddenness or as the result of a definite and easily rememberable event in the child's life. In many, perhaps most cases, the development of the disorder is gradual, and its earliest manifestations so little violent that no great heed may be paid to them. This is the more likely to be true if the primary manifestations occur before speech is fully developed. Further, the stuttering child is seldom reported for clinical examination or treatment until the disorder has been established for years, and the date of its earliest manifestations forgotten. The parents of the stuttrer, in addition, show a decided inclination to post-date the actual beginning of the trouble in the interests of their own preconceived notion of its origin, and in particular as a consequence of a tendency to trace the responsibility for it to the school. Care is necessary to establish quite definitely whether or not the disorder appeared before or after the child first went to school. In Table II, over, the number of cases in the present investigation in which the stuttering first appeared at each of the specified ages from two to thirteen years is shown. Immediately following, in Table III the corresponding figures given by /

by Boome and Richardson in The Nature and Treatment of Stammering are reproduced for purposes of comparison. The percentages in the latter case have been calculated to render the data directly comparable with our own.

Age	2-	3-	4-	5-	6-	7-	8-	9-	10-	11-	12-	13-	
Boys	12	10	17	16	6	8	-	1	-	1	1	-	72
Girls	-	1	7	1	1	1	1	-	1	1	-	-	14
Total	12	11	24	17	7	9	1	1	1	2	1	-	86
Per cent	14.0	12.8	27.9	19.8	8.1	10.5	1.2	1.2	1.2	2.3	1.2	-	

TABLE II.

Stuttering - Age of Onset.

Age	2	3	4	5	6	7	8	9	10	11	12	13	
Boys	83	47	54	63	31	36	32	22	11	5	2	1	387
Girls	11	11	12	15	10	13	7	10	1	-	-	-	90
Total	94	58	66	78	41	49	39	32	12	5	2	1	477
Per cent	19.7	12.2	13.8	16.4	8.6	10.3	8.2	6.7	2.5	1.1	0.4	0.2	

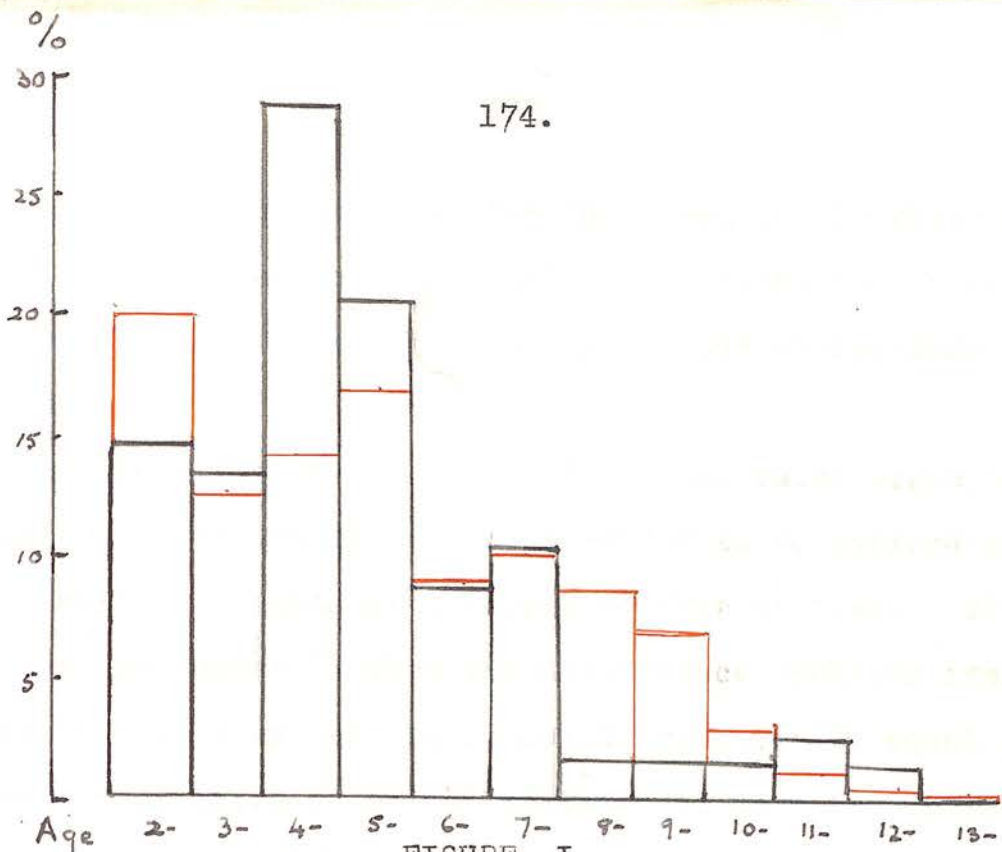
TABLE III.

Stuttering - Age of Onset (Boome and Richardson).

According to our figures, in fully 74 per cent of the cases stuttering had developed before the age of six, and in 93 per cent before the age of eight. The corresponding percentages for Boome and Richardson's data are 62. and 81 respectively. The most marked discrepancies between the tables occur at the ages of 2, 4, 5, 8 and 9 years. At the second and third of these age-levels, the figures show a very marked increase in our Table at the expense of the other three. According to our data, the number of new cases occurring after the age of seven years is a mere 7 per cent, as against the corresponding figure of nearly 20 percent for Boome's data. Three of the twenty-four four-year-old children amongst our cases began school at that age, the disorder appearing almost simultaneously.

The one set of figures in the main corroborates the findings of the other regarding the crucial ages for the onset of stuttering, which occur as Boome has pointed out at "stages in the normal development of every child which being periods of mental or physical stress, may be in themselves sufficient to account for the onset of stammering (stuttering), given the predisposition".

The first danger-point occurs, not so much at the stage of learning to talk, as at the stage of transition from /



Onset of stuttering - Boome's percentages in red.

from early echolalia to the voluntary control of speech - a transition which appears from the best records of the development of speech we possess, such as that of Preyer, to be attended by very real difficulty.⁽ⁱ⁾ In some sense the child has to make almost a fresh start in the acquisition of speech. He has to make a real effort to bring under control for the purpose of exact expression and communication words which he may have been able for some time to pronounce clearly and more or less correctly by imitation or as elements in his childish sound-play.

Careful /

(i) This point is more fully discussed in the section in Part I dealing with the theory of Hopfner and Fröschels.

Careful observation indicates that even in the child who manifests no subsequent disorder of speech, the process of development is accompanied by obvious expressions of strain.

Nearly fifty per cent of all our cases began to stutter sufficiently for the disorder to be noticed by the child's parents at the ages of four or five. Of these the number in whom the disturbance declared itself just before they went to school is practically equal to the number where it is not admitted to have been present until just after that time. But time after time in the former group it is reported that a very slight disorder of speech became seriously aggravated as soon as school education began. The school situation in itself cannot be held responsible for the onset of the disorder, but it may be in many cases a factor of special significance, as it is in all cases a very important one, at a stage of unusual difficulty in the child's development. That the new environment makes a sudden, sharp demand upon the child's powers of expression at a time when their development has been barely completed, and when consolidation of his recent acquisitions has hardly begun, is obvious. But this is only one aspect, and by no means the most important one, of the fact that in going to school the child is /

is compelled to make the first great social readjustment of his development. For the first time he has to endure for a considerable part of every day separation from home which has hitherto constituted the circle of his universe, and from the care of his mother, who has been the principal figure in it. Whether or not we can accept in detail the Freudian theory of the Oedipus complex, their conception of the primary "eternal triangle" is grounded upon undeniable facts of the child's development. It cannot be without significance that need for adjustment to the new, and frequently unwelcome element of the school arises just when the relationships between the child and his parents are, for the first time, as we say, coming to a head. If stuttering could be considered as a regressive manifestation, there are factors here which, given a certain background of disposition and experience, might well work together to arouse it.

The fact that the same slight rise in the number of fresh stutterers about the age of seven occurs in Boome's figures as well as in Table II suggests that it may have some significance. The age of seven has always been recognised as marking a developmental stage. It is, as Boome notices, not only the period of second dentition, but /

but also, for most children, the age of transfer from the primary department of the school to the larger and more difficult world of the junior school. The change is accompanied by a more or less distinct psychological development which has been described by Sir Percy Nunn, adopting the general sense of the Freudian terms, as a transition from the earliest phase regulated by the pleasure-pain principle to one where the reality principle plays an increasing part. The boy now really emerges from the fantasy-world of desire into the harder world of necessity.

There seems to be little reason to believe that stuttering arises, except in rare cases, after this stage has been passed. Only six of our cases began to stutter at the age of eight or later. In two of these (both girls) the speech disorder had accompanied ill-defined choreic symptoms, diagnosed and treated as such before the children were reported to the Psychological Clinic in connection with the disturbance of speech, and in one of the two the stuttering was itself no more than an almost vanished remnant of the deeper temporary disturbance.

These data permit no conclusion regarding the relation between pubertal development and the onset of stuttering.

It /

It has already been said that the school-situation in itself cannot be regarded as inducing the disorder. But the large number of children who begin to stutter at or about the beginning of the school-period may well give the educationist pause. There is no doubt that the classroom is the most difficult situation in which the stuttering child, and perhaps also the child who is only predisposed to the disorder, can find himself. The exacting demands made by the teacher upon the child's powers of speech - especially when, as is the case for most Scottish children, he must on going to school become virtually bi-lingual - before the most critical of all audiences, an audience of contemporaries, present the severest of all tests for such children. It is for this reason that in nearly all cases the school-room must be regarded as the principal agency in aggravating to real severity a disorder already present, and in a not inconsiderable number as supplying the finishing-touch to an unfortunate process of cumulative development. It is commonly stated and readily comprehensible that the number of children with defects of speech is lower amongst the population of the nursery-schools than elsewhere. It would be interesting to know whether this is true also of stutters, and very significant if it could be proved that /

that this disorder occurs for the first time at the age of five less frequently in nursery-school children transferred then to the Infant department of the ordinary school than in children beginning school at that age.

5. Intelligence and Educational Progress in the Stuttering Child.

Stuttering, as we have seen, is far commoner amongst mentally deficient than amongst normal children. But the stutterer is not defective. On the contrary it is frequently asserted by teachers and others on a background of half-formed theory regarding the origin of the disorder that the stuttering child is more likely to be above than below the average in intelligence. The assumption is commonly supported by reference to the well-known cases of stuttering in men of undoubted genius. C.S. Bluemel in his Stammering and Disorders of Speech presents an imposing list of these from Demosthenes and the Stagirite, downwards. But in many of the examples of this kind generally cited, the specific disorder is in the nature of things only to be accepted with caution as having been stuttering. In his Study of British Genius Havelock Ellis was able to trace thirteen cases of the disorder, with the probability that the figure is incomplete, amongst the persons of exceptional ability who fell /

fell within the scope of his survey. Such a figure points to an abnormal prevalence of stuttering at the higher levels of the intelligence-scale. It is reasonable to suppose that stuttering, as a derangement of nervous function, might occur more frequently, like left-handedness - and all the more so if there is a relation between the two anomalies - in neurotically disposed children of any degree of intelligence, whether normal, supernormal, or subnormal. Individual tests of general intelligence which require an oral response, might be expected to meet with a serious difficulty in the examination of stutterers, and to do injustice to their ability. In the present investigation, however, an intelligence-rating was obtained for nearly all of the cases by means of the Herring Revision of the Binet-Simon Scale (Series A and B). A few of the youngest cases were examined with the Stanford-Binet Tests. To substitute performance tests was impossible in the time available, and the Herring tests allowed of observation of the stutterer's speech under such conditions as the test made necessary. Every reasonable precaution was taken to ensure that the child was as much at ease as possible before testing was begun. I can here only assert my conviction that the number of cases which have suffered at all from the method of /

of examination is very small indeed. In the great majority of these stuttering cases the only detectable difference between their responses or their attitude during the test and those of normal children was to be found in the stuttering itself. In not a few of them under clinical conditions the speech-disorder was so reduced that even this external ground of differentiation failed. It had seemed at the outset that repetitive stuttering during the Number Series test and that of repetition of digits in reversed order after the examiner would render the employment of the scale impossible. But not the least surprising, and perhaps not the least significant phenomenon in the responses appeared in these tests, in that in the great majority of the cases, stuttering tended to disappear altogether. In a small number of cases it was possible to apply either the Stanford-Binet tests or the Drever-Collins Performance Scale as well as the Herring Tests. In four of these cases the results of the two tests were almost identical; in one it was slightly in favour of the Performance test; in one it was markedly better on the Herring tests, administered first, than it was on the Stanford. In one only was there an extreme difference in favour of the result on the performance test. Actually the boy in question (Case /

(Case No. 50) showed no severe manifestations of the speech-disturbance during the verbal test. There was reason to believe, however, that he was at a severe educational disadvantage in a test so largely dependent upon ability in reading. He had but recently come to Scotland from Canada, where he had been transferred to a Special (M.D.) School on account of the speech-disturbance. The result on the performance test, which gave him an Intelligence Quotient of 104 as against one of 74 on the Herring Scale, was therefore in accordance with expectation and in keeping with his marked retardation in reading. The child who made the highest score in the group on the Herring tests was one of the most severe cases of stuttering amongst all those examined. Yet his intelligence quotient of 143 is the highest yet obtained from any child examined at the University Clinic. Taking these facts into consideration along with the actual distribution of intelligence quotients obtained and shown in Figure II below, there seems to be little reason to doubt the reliability of the results.

FIGURE II (over).

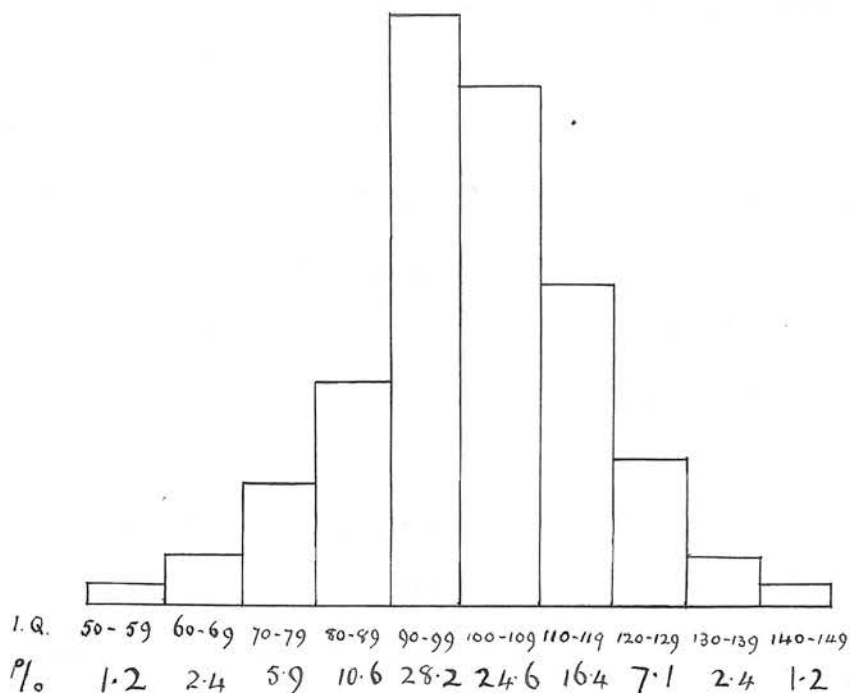


FIGURE II.

Distribution of I.Q.'s of 85 stuttering children.

The mean I.Q. for the group is found at 101 ± 1.2 .

Taken as a whole the group is very normally distributed, showing only a negligible tendency for scores to be above rather than below the average. These results suggest: (a) that stuttering may occur at all levels of the scale of intelligence, and (b) that stuttering is not specifically related to deviation from the normal in intelligence as such.

Although it is at least as probable that the individual stutterer will be found to be above rather than below the average in general ability, it has been asserted from time to time that stuttering children as a group tend to show some degree of scholastic retardation. Since the pedagogic emphasis still falls as a general rule upon verbal ability, and upon learning by saying - when it is not merely to say - rather than by doing, it would not be surprising if stuttering children should be at a disadvantage in school. Fletcher quotes investigations by Wallin in St. Louis, and Conradi, both of which reveal a tendency to educational retardation among stuttering children. In Wallin's study, carried out by questionnaire, the stuttering children were even more seriously retarded than the nondescript group of speech defectives generally whom he calls "lispers". The stutterers were retarded in school by 1.6 years on the average, and the lipsers by only 1.1. The significance of these results is considerably diminished, however, by the fact that no attempt is made to compare the actual degree of educational backwardness with the level of the child's intelligence. Many factors are at work in the ordinary school to prevent the child's progress being anything like commensurate with the level of his intelligence, but, discounting /

discounting these for the moment, the child who is mentally retarded will tend naturally to fall below the class where, on the basis of chronological age alone, he ought to be found. But stutterers, as we have seen, quite frequently show actual retardation of intelligence, so that a certain degree of retardation in those cases at least is not only to be expected, but is also educationally justifiable. At least one of our cases, although still maintaining in spite of a mental ratio below 60 a precarious position in the ordinary school, could hardly be expected to have made the educational progress warranted by her eight years in school. A further objection to evidence of scholastic retardation based upon the school grade actually attained by the child is that, even if it could be proved, it might tell us more about educational policy in dealing with the stuttering child than it does about his scholastic ability or the effect of the speech disorder upon his school-work. Travis has some significant remarks on this point. He says: "In studying the lives of a large number of stutterers, most of whom are university students of superior mental ability, we have found that in many cases scholastic retardation has been a result of instructional policy; that is, inability to recite orally and a general unresponsiveness on /

on the part of the stutterer often prompts his teachers to fail him in work which he is intellectually capable of doing". The stutterer is balked of promotion not because he is a stutterer, but because he is prevented by the speech-disorder, from "showing up". But the results of more careful studies do not indicate any marked degree of differentiation in school progress between the stuttering child and the normal speaker.

MacDowell carried out such an elaborate experimental study of sixty-one stuttering children in the schools of New York. The stutterers were paired with a normal control group equivalent in chronological age, mental age, intelligence, sex, and certain other relevant factors. No significant differences were found between the groups in any of the psychological or educational tests applied, the only basis of differentiation being the presence or absence of the speech-disorder itself.

In the present investigation a moderately trustworthy picture of the educational attainments of the stuttering children examined may be obtained from two sources - the one the reports, supplied for most of the cases on a specially prepared form by the class-teachers; the other the results of the different tests of scholastic achievement applied at the Clinic. The conclusions which /

which we may draw from the tests are only tentative and are open to criticism in the absence of a control-group, which could not be obtained under the conditions of the research, and ^{which} was not a prime necessity to an investigation not chiefly concerned in its practical bearings with the educational characteristics of the stutterers as a class. The number of children within the group itself from whom results on such tests could be obtained was conditioned also by the co-operation of the parents, by whose goodwill the children were allowed to return to the Clinic for these additional tests. Wherever possible, however, the following tests were applied:

(a) Burt's Graded Vocabulary Test of Accuracy in reading (i.e. Test 1 of the tests of educational attainment given in his Mental and Scholastic Tests). This test was administered to, and in spite of the speech-disorder, a reliable result obtained from 58 of the cases. It is to be remembered that for many stuttering children the reading of such isolated words is much less difficult than the reading, with due attention ^{to} sense, expression, and above all, rhythm, of a passage of continuous material.

(b) Burt's Graded Vocabulary Test of Spelling (i.e., Test 6 of the achievement tests in his Mental and Scholastic Tests) or Burt's Dictation (Continuous Graded Test) (i.e. /

(i.e., Test 7 in the same series). The former was employed with the cases who were over 7 and below 10 years of age, and the latter with the cases who were above 10. Seven children were tested in the younger group, and forty-two in the older. In all cases the responses were written.

(c) Burt's Northumberland Standardised Tests in English (1925 Series). Forty of the children over ten years of age were examined by means of these tests.

From the teachers' reports we have relevant information in 64 cases upon the following points:

- (1) the child's stage in school and the average age of the children in the same class.
- (2) the general quality of his work in school, rated as poor, good, very good, or excellent.
- (3) his position in class.

The first obvious comparison possible is the crude one between the chronological age of the child and the average age of the class in which he finds himself. Under present educational conditions in Scotland, the system of organisation takes no account - except with a view to the segregation of the mentally deficient - of mental age. In addition, the practice of promotion at fixed intervals is still general and rigid, so that, although in the grosser cases of maladjustment or failure to measure up to the required standard, there may be some opportunity /

opportunity or attempt to retard the progress of the duller child, there is still little or none to accelerate that of the intelligent. The belief in the correspondence between age and ability, and in consequence between age and stage in school, dies hard. In order, therefore, to judge the progress of our stuttering group by the standards of the schools themselves - the standard used by Wallin in the investigation reported above - the crude comparison between age and stage as indicated by the average age of the class is less unfair than any other.

The actual correlation of $.89 \pm .18$ between the chronological age of the stutterers and the average age of the classes from which they are drawn is sufficiently high to show that the general principle and practice of classification is as we have described it. The detailed results of the comparison are set out in Table IV.

Deviation from Average.	No.	Per cent.
Retarded by 2.6 - 3.0 -	2	3.2
" " 2.1 - 2.5 -	2	3.2
" " 1.6 - 2.0 -	1	1.6
" " 1.1 - 1.5 -	2	3.2
" " 0.6 - 1.0 -	13	21.0
" " 0.1 - 0.5 -	21	34.0
At age..	6	9.6
Advanced by 0.1 - 0.5 -	13	21.0
" " 0.6 - 1.0 -	1	1.6
" " 1.1 - 1.5 -	0	0
" " 1.6 - 2.0 -	1	1.6

TABLE IV.

Educational Attainments of Stuttering Children.

(a) Comparison of Chronological Age with Class Average.

Against this first comparison and before we draw any conclusions from it, we set the results of comparing in the same way the mental ages of stutterers with the same class averages. The procedure is barely justifiable since the average mental age of the class may differ considerably from the average chronological age of the children in it. But in ordinary school practice the average chronological age of each class serves, often in an unconscious way, as an expression of its educational level, an educational age, a step in the scholastic ladder. The correlation between the mental ages of the stuttering children and these average chronological ages is $.71 \pm .06$. In a school-system where the organisation approached a little more closely to the ideal than it does at present this correlation might well be lower still. But it would not be lowered, as it has been here, and as the figures in Table V indicate very clearly, by a practice of fitting the child chronologically to the stage, instead of fitting the stage to the child's mental ability.

TABLE V. (over).

Deviation from Average.	No.	Per cent.
Retarded by 3.6 - 4 years -	1	1.6
" " 3.1 - 3.5 " -	0	0
" " 2.6 - 3.0 " -	4	6.4
" " 2.1 - 2.5 " -	3	4.8
" " 1.6 - 2.0 " -	4	6.4
" " 1.1 - 1.5 " -	8	12.8
" " 0.6 - 1.0 " -	7	11.2
" " 0.1 - 0.5 " -	12	19.2
At age.....	4	6.4
Advanced by 0.1 - 0.5 " -	2	3.2
" " 0.6 - 1.0 " -	9	14.4
" " 1.1 - 1.5 " -	2	3.2
" " 1.6 - 2.0 " -	0	0
" " 2.5 - 2.5 " -	3	4.8
" " 3.0 - 3.0 " -	3	4.8

TABLE V.

Educational Attainments of Stutterers.

(b) Comparison of mental age with class average.

In Table V the expression "retarded by 3.6 to 4" years, means that the mental age of the child is higher by that amount than the average chronological age, considered here as a mental age, of his class. A superficial consideration of Table IV, which shows that 20 of the cases, or 32 per cent, are more than six months older than the average of their class, might suggest that there is an unusual proportion of scholastic retardation amongst these stuttering children which might be related in one way or another to the speech-disorder itself. But closer study reveals that in 12 of those twenty cases the retardation is /

is justified - in some instances justified several times over - on grounds of mental age alone. In three there is similar ground for some degree of retardation, although less than that which actually exists: in two cases real mental retardation amounting to .5 and .8 years respectively as against an actual retardation in school of 1.4 years, and in a third (Case No. 76) an actual retardation of fully three years although his mental age is barely one year below normal. In this last case very severe stut-tering was accompanied by cleft-palate speech. In a fourth case (No. 50) retardation was fully justified by educational backwardness which, as we have already indicated, was traceable to the speech-disorder only in so far as it had been the quite unwarrantable pretext for sending him to an auxiliary school. In the remaining four cases, the relation between the ability of the children and their actual progress in school is as follows:

Case No. 55	Retarded in school by 0.6 years	M.A. advanced by 0.7 years.
" " 65	Retarded in school by 1.25 "	M.A. advanced by 0.35 "
" " 68	Retarded in school by 0.75 "	M.A. advanced by 1.0 "
" " 69	Retarded in school by 0.7 "	M.A. advanced by 0.7 "

The twenty cases which are retarded, in respect of chronological /

chronological age, by more than half a year are balanced by only two which are advanced by more than six months. This cannot, however, be taken as an indication that the intelligent stuttering child fails on account of the speech-disorder to make good his higher ability by more rapid progress through the school, although he might reasonably find it more difficult to do so than the normal child. It is simply the result of the fact that the school makes no provision for the rapid advancement of the abler pupils, in the interests of a simple system and a false democratic principle. This is indicated very clearly in Table V, where we find that some 43 per cent of the cases have a mental age which is more than six months higher than the average chronological age of the classes from which they are drawn.

The schedule completed by the class teachers supplies for sixty-four of the cases two separate assessments of the child's work in school. In the one a rating on a four-point scale is assigned for general quality of work. As a check upon this mark, the teacher was requested to indicate more exactly the child's position in class. It has been possible, although precise ratings were seldom given under the latter heading, to group the judgments under the five heads shown below. In both, as the tabulated figures indicate, there has been a tendency to over-weight /

over-weight the distribution at the lower end. This is more marked in the judgments of general quality of work, in part because of the more impressionistic nature of the assessment, which allowed greater scope to a well-established inclination in the teachers, in part perhaps because the prepared scheme limited them to only four possible assessments, and in part perhaps, as a result of the terms actually used in that scheme.

Teachers' ratings for general quality of work:

	<u>Poor.</u>	<u>Good.</u>	<u>Very Good.</u>	<u>Excellent.</u>
No.	22	29	11	2
Per cent.	34.4	45.3	17.2	3.1

Position in class:

	<u>Low.</u>	<u>Below Average.</u>	<u>Average.</u>	<u>Above average.</u>	<u>High.</u>
No.	18	14	12	12	8
Per cent.	28.1	21.9	18.75	18.75	12.5

Taking the two ratings together and giving due weight to the apparently greater reliability of the latter, the general conclusion seems to be permissible that the performance of these stuttering children in actual school work is ~~is~~^{only slightly} below the average of normal children at the same stage.

It might reasonably be supposed that the stuttering disorder, /

disorder, if it were to have any effect at all upon the child's success in school, would exert its maleficent influence most directly and most distinctly in those subjects of the ordinary curriculum where linguistic ability and oral expression are at a premium. From an examination of dextro-sinistral stutterers reported in 1912 Ballard concluded, contrary to Conradi, that although the stutterers' marks in English, which includes reading and recitation, are "rather low", they are rather above than below the average in general ability. But are the stutters, as a group below the average even in English? Four distribution-diagrams are given here showing the educational quotients of those of our cases who were examined by means of the linguistic tests already mentioned. The educational quotients have been calculated on the basis of Burt's norms, obtained for London elementary school children. It is probable at least in the case of the spelling and Northumberland (English) Tests, that these norms are lower than ^{those that} would be obtained under similar conditions from children in the Edinburgh schools. In administering the Northumberland Tests only the first five of the seven tests in the battery were employed, viz.,

Test I - Reading (Questions).
 Test II - Reading (Words).
 Test III - Sentences.
 Test IV - Paragraphs.
 and Test V - Spelling.

In Figures III - V, the data are given separately for the three tests of reading (Burt's Graded Vocabulary), spelling (Burt's Graded Vocabulary or Dictation), and the Northumberland Tests. Figure VI is based upon an average educational quotient in English obtained for each child who had taken at least two out of the three tests. Actually 34 had taken all three tests, while six were children under ten years of age none of whom were examined by the Northumberland Tests.

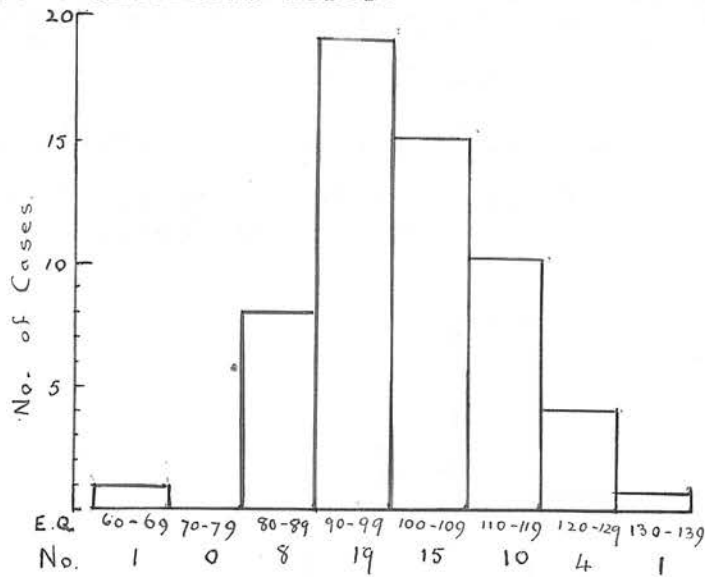


FIGURE III.

Educational attainments of stuttering children.

(c) Distribution of educational quotients (58 cases) in oral reading.

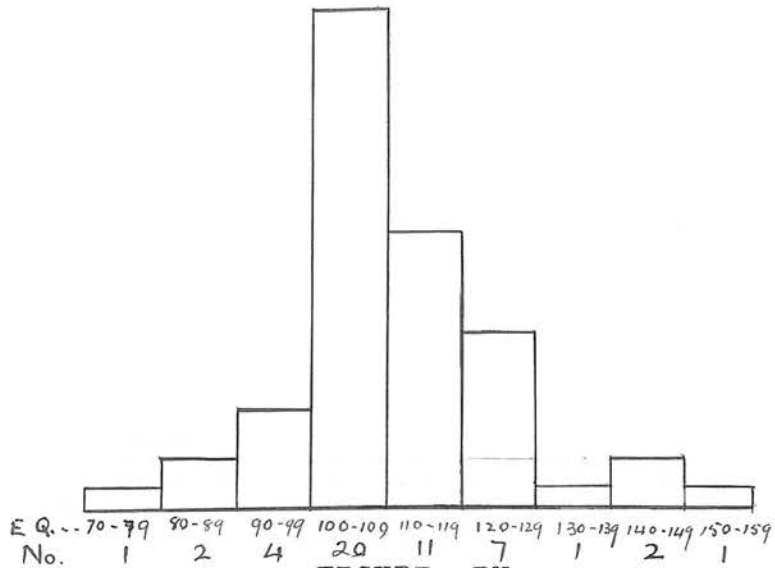


FIGURE IV.

Educational attainments of stuttering children.

- (d) Distribution of educational quotients (49 cases) in spelling.

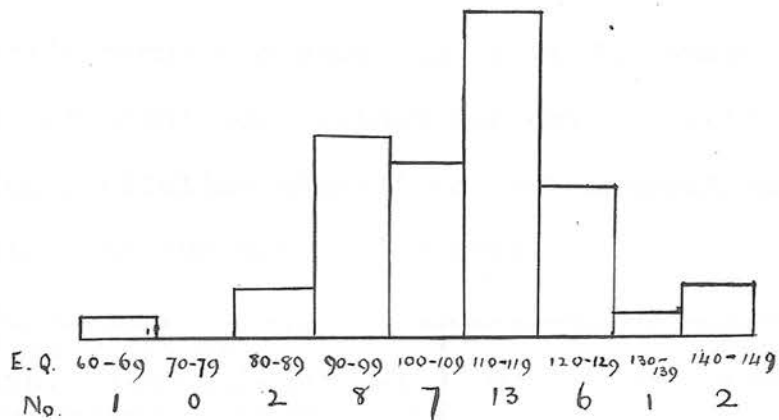


FIGURE V.

Educational attainments of stuttering children.

- (e) Distribution of educational quotients (40 cases), (Burt's Northumberland Tests).

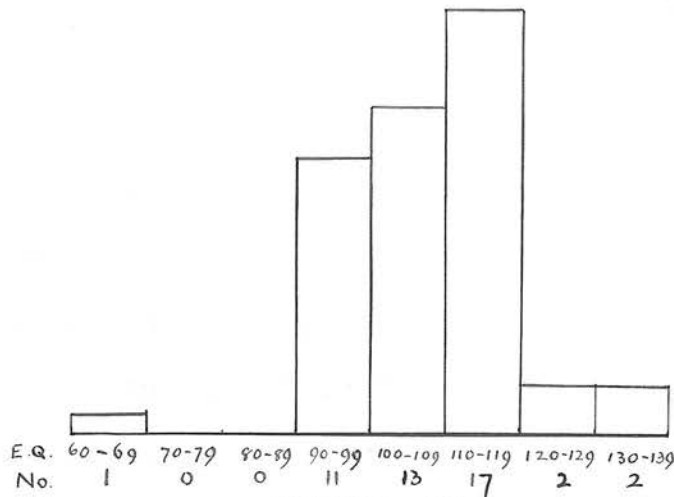


FIGURE VI.

Educational attainments of stuttering children.

(f) Distribution of educational quotients (46 cases) in English.

The deviations of the actual scores on the various tests from Burt's norms are shown in Table VI, where the number of cases is tabulated against the deviation in years, a plus sign indicating educational advancement and a minus retardation on the particular test.

Deviation in years.		-4 or more.	-3	-2	-1	0	+1	+2	+3	+4 or more.	Total.
N o. o f c a s e s	Reading	1	3	6	9	18	11	7	3	-	58
	Spelling	-	1	4	4	15	10	7	3	5	49
	English	3	3	3	3	7	9	5	2	5	40

TABLE VI.

Educational attainments of stuttering children.

(g) Scores on Burt's Tests compared with norms.

The tabulated results speak clearly enough for themselves, and it would be unwarrantable to elaborate upon them in the absence of a control group with which the performance of these stuttering children can be compared. But it seems to be possible without going beyond the indications of the data to come to two reasonably supported conclusions. On the one hand, so far as the results of these tests are concerned, and so far as the indications of the educational quotient may be taken to be reliable, the stuttering child is at least as likely to be found working above as below his ability. On the other, there is no indication that stuttering children as a group tend to show retardation in the linguistic subjects of the school course. In Table VI oral reading is the only one of the tests in which at least half of the children tested do not show one year or more of advancement, and even in reading, where such a result is to be expected, considerably less than half of the group fall below the norm for their age. This result applies only to the assessment of mechanical accuracy by means of a vocabulary test of the kind employed here. It is manifestly impossible to judge the stuttering child for fluency and expressiveness in reading continuous prose or verse.

6. Heredity and Imitation.

Cut fingers, it has been said, may be hereditary, and /

and few investigators of the problem of stuttering have failed to notice the tendency of the disorder to occur in different members and in different generations of the same family. But the relative part played by endogenous and exogenous factors in the causation of the disorder is far from clear and few attempts have been directed to obtaining more accurate information. The solution of the problem is obscured in the case of stuttering by the possibility of imitation, especially in instances where one or other parent of the sufferer also stutters. Gutzmann has asserted that 10 per cent of his stuttering cases are the result of pathogenic infection. But even where the stuturer is the offspring of parents who themselves suffer from the speech-disorder, imitation cannot be the sole factor at work. In the same family only a few, perhaps only one, of the children will acquire the parental speech-disorder. Of similar significance is the observation that the children of a stuttering parent may speak satisfactorily for years before any sign of the trouble develops.

In the present investigation every effort was made to obtain reliable information regarding the incidence of stuttering amongst the other members of the families of the cases examined. The results of the enquiry are shown /

shown in Table VII. It is noteworthy that in only two cases was it suggested by the mother that the speech-disorder had arisen as a result of association with another stuttering child outside the stutterer's own family

Relationship.	No.
Father alone.	5
Mother alone.	2
Father and Mother,	1
Father and others on same side.	2
Mother and " " " "	2
Father's side but no parent.	9
Mother's side " " "	12
Both sides " " "	2
Older brother or sister but no parent.	6
None traced.	36
Total	77

TABLE VII.

Familial Incidence of stuttering.

Omitting the six cases in Table VII where the only discoverable stuttering relatives are older members of the stutterer's own family and generation we find that in 35 of our cases or 45 per cent of the total there is a record of stuttering in either or both of the immediately preceding generations. In 24 of these, or rather more than 30 per cent, there is every reason to believe that the possibility of imitation is precluded. This occurs even in some /

some of the cases where one or other parent has been also a stutterer, if the disorder clears up before marriage or before the child is born. In none of these twenty-four cases has there been an actually stuttering relative living in the same home, and in many of them the possibility of temporary contact is quite definitely ruled out.

Speculation regarding the machinery of the hereditary influence in stuttering, supposing any such to be at work, has been conditioned by the parti pris of the different theorists. Most commonly they have restricted themselves to the supposition of a vague neuropathic diathesis, an emotional instability, or "nervousness" of a general kind, which may or may not eventuate in stuttering. Reliable information on a matter of this kind is difficult to obtain and no definite conclusion can be drawn from the fact that few of our cases appear to show clear evidence of neurotic heredity, if we disregard the indications of the disorder of speech itself. The small number of cases in which marked instability appeared in one or other of the parents (e.g., Case No. 1), or in which there were minute but unequivocal indications of it, afford no basis for generalisation.

In accordance with his neurophysiological interpretation of the disorder, Travis has suggested that, if the /

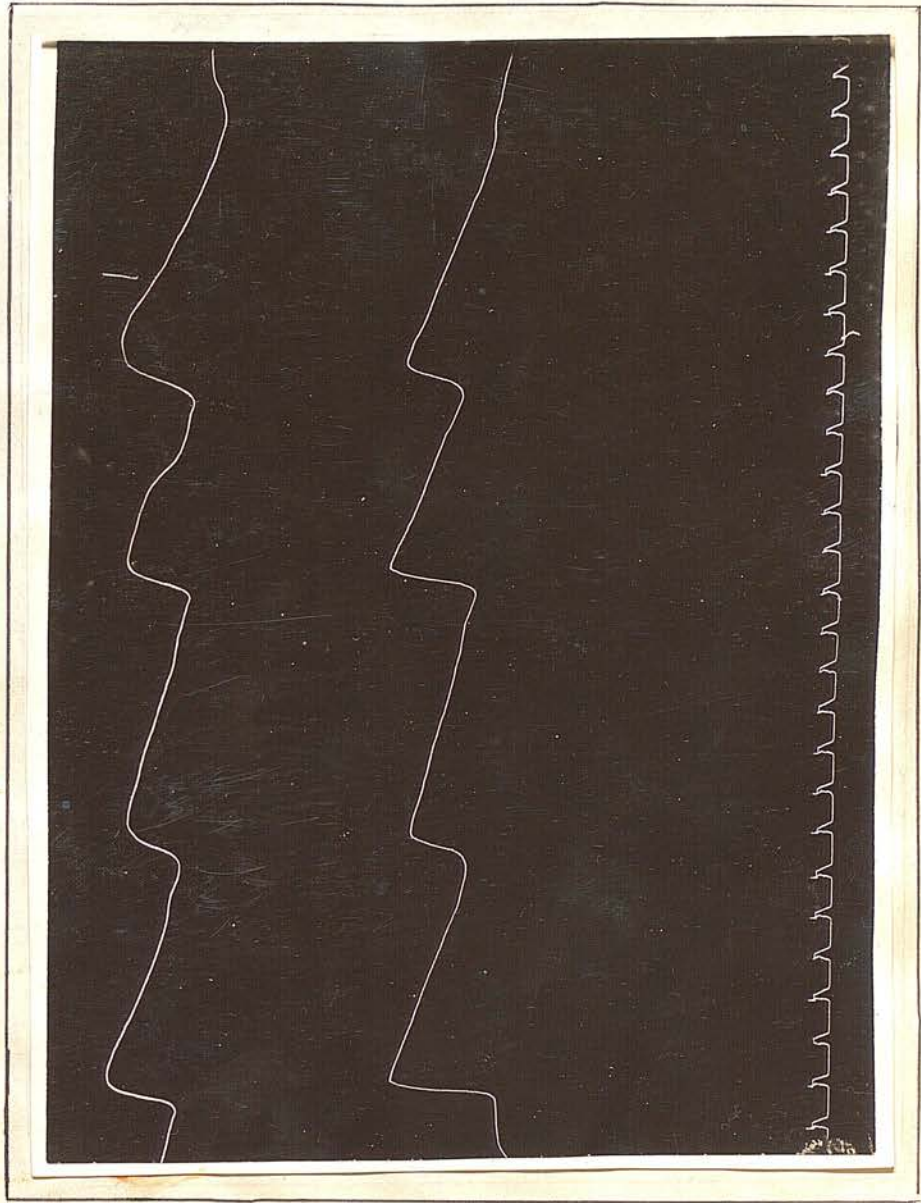
the normality of the function of speech depends primarily upon the dominance of one hemisphere, on the strict "one-sidedness" of the individual, then the tendency towards arrest or inadequacy in the development of such unilaterality may be inherited. He believes that the family histories of stutterers, in so far as they show a large number of left-handed relatives amongst the next of kin of the sufferer, indicate that the sufficiently strong bias towards the establishment of the desired unilaterality is lacking in them. Amongst our cases only twelve out of seventy-five children who were living in their own homes had left-handed relatives, father, mother, brothers, or sisters, in their immediate family. This number is very much lower than those quoted by Travis and others.

7. The Symptoms of Stuttering.

No detailed analysis will be attempted here of the bewildering manifestations of the disorder, but a number of kymograph records are presented which illustrate the nature of the disorder of function as it appears in the breathing of the stutterer during speech, and attention will be called to some of the more significant results of the actual examination of speech.

(a) Breathing during speech.

During normal speech the respiration curves show a regular /



Normal Respiration Plate I during Reading aloud.

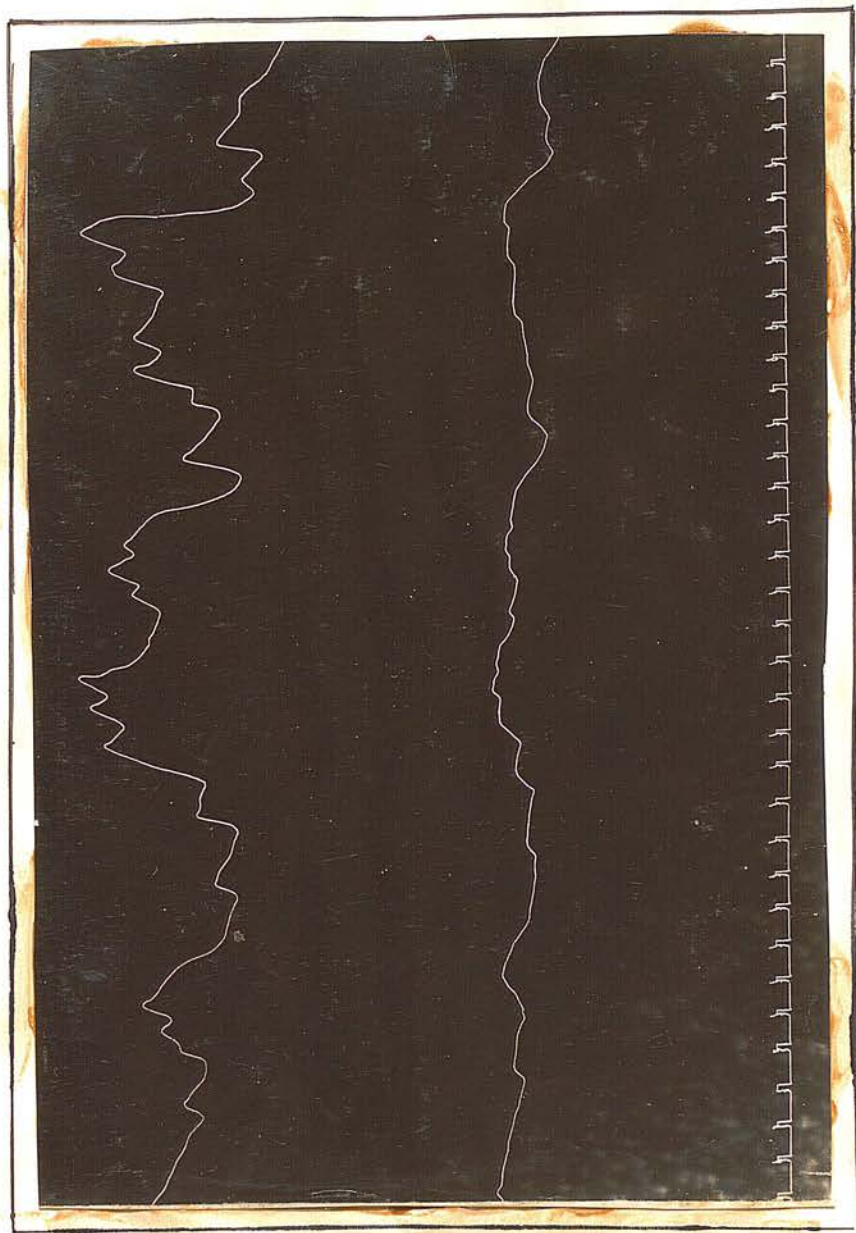


Plate II
Respiration during Stuttering Speech. (Reading aloud).

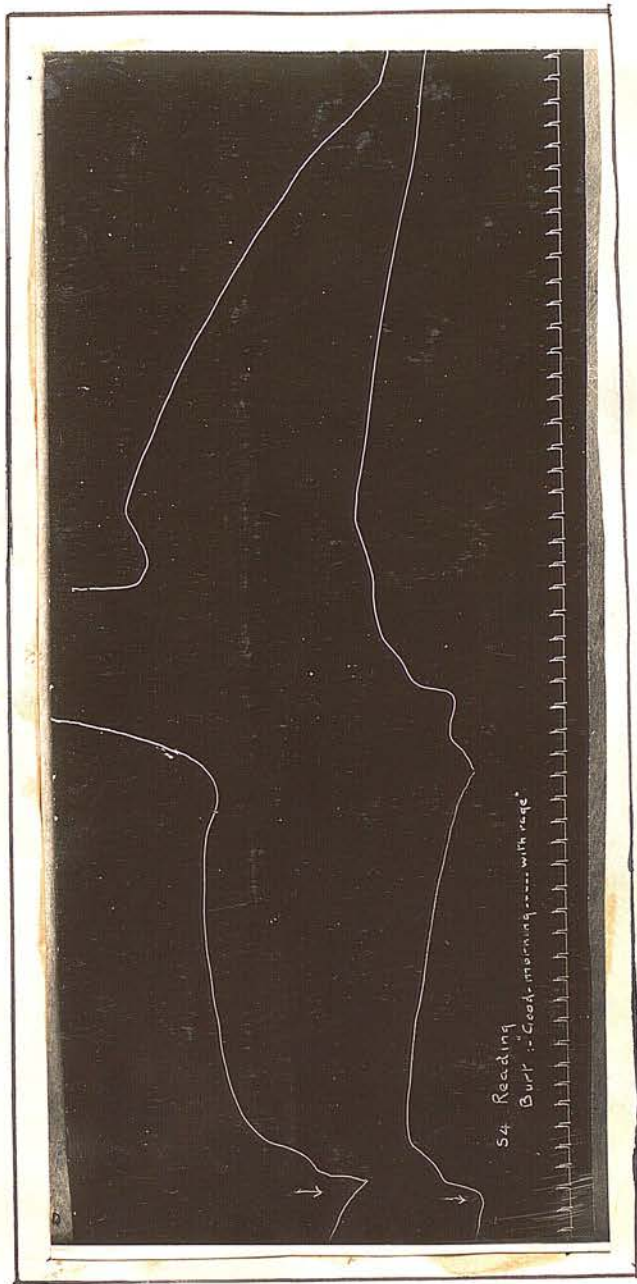


Plate III

Respiration during
stuttering speech (Reading Aloud).

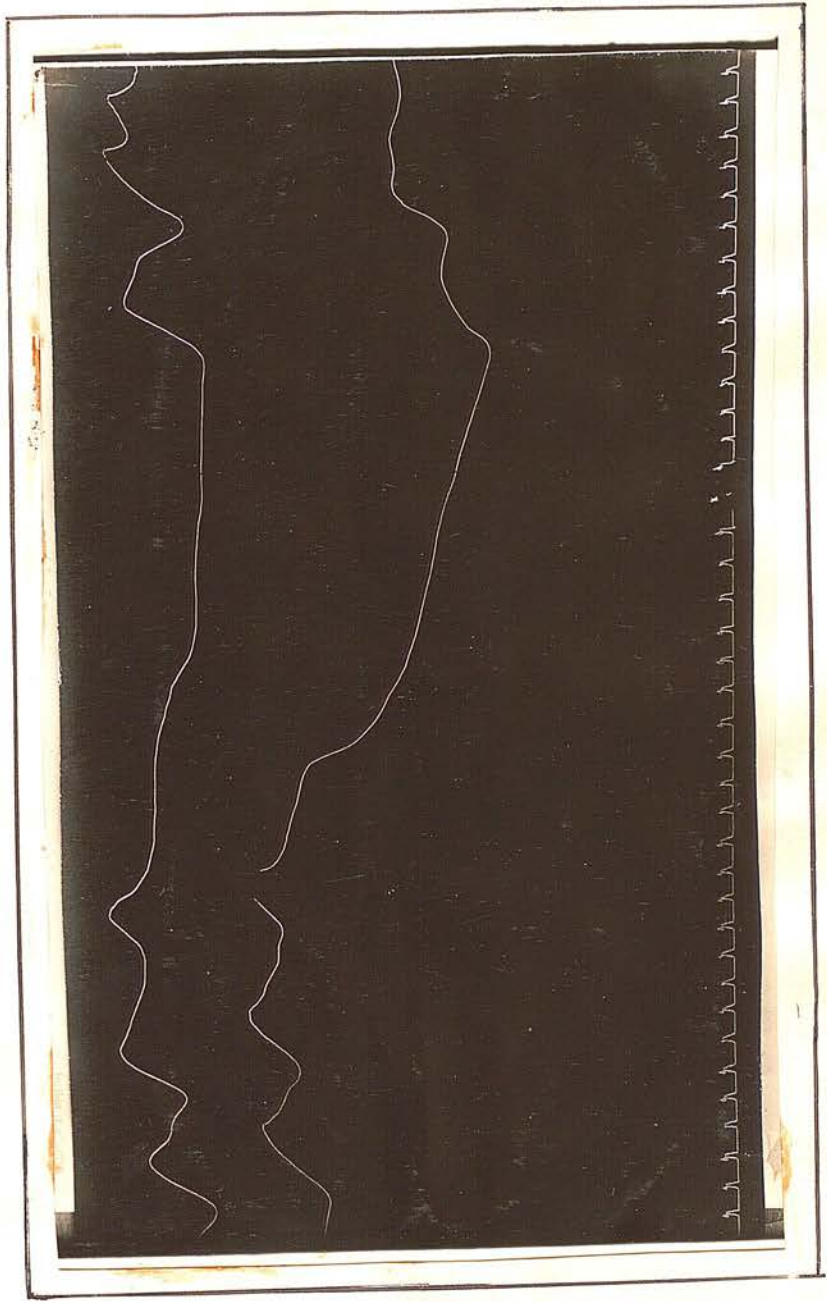


Plate IV

Respiration during stuttering speech (Reading aloud).

regular and characteristic form (Plate I), of which the distinguishing features are:

- (1) the rhythmic relation between inspiration and expiration.
- (2) the marked prolongation of the period of expiration by comparison with ordinary rest-breathing.
- (3) short inspiration followed by a period of smooth expiration in accordance with the logical sequence of expression.
- (4) fairly close synchronisation between abdominal and thoracic breathing, in which thorax and abdomen function as a single unit.

The three stuttering records shown in Plates II to IV were all obtained while the subjects were attempting to read aloud the same passage of continuous prose as was read by the normal speaker whose record is shown in Plate I. The records of the stuttering subjects reveal abnormalities in all four of the principal characteristics of breathing during speech as these have been enumerated above. In all of the records the typical relationships between expiration and inspiration have disappeared, and the whole process has become arrhythmical in the extreme. Speech and the thought to be expressed, and further back and all the more distinctly, respiration and thought are out of tune. Plate II, a record taken during more or less continuous speech, in which the principle overt manifestation of the disorder consisted in clonic repetitions which never became severe, illustrates this annihilation /

annihilation of the normal rhythm very clearly. Instead of a regular sequence of synchronised rise and fall in the curves, the record shows a highly irregular progress in which inspiration is interrupted by expiration, or expiration by inspiration apparently at haphazard, and where sudden involuntary releases of the air in the lungs, especially marked in the thoracic curve, have to be compensated by a prolonged inspiration, which is contrary to and continually interrupted by the attempt at utterance. The second stuttering record, Plate III, shows even more clearly the disappearance during stuttering reading of the temporal sequence and the thoracic-abdominal phase relationships of normal respiration. The subject who produced this tracing exhibited all the signs of very severe distress during reading. The record reveals severe tonic cramp in the mechanism of breathing, followed by a strong inspiratory spasm of the thorax which is not paralleled at all in the abdominal curve. The same remarkable fluctuations of the thoracic curve were several times repeated in a single record. Plate IV is quite literally a record of breathing during attempted speech since at no time during the period of this tracing was the subject able to articulate distinctly a single word. For most of the time he was quite silent, never achieving more than a momentary laryngeal /

laryngeal murmur. Considered together the stuttering records show: (1) a complete failure of the normal rhythm of respiration; (2) apparently unpremeditated, though not necessarily involuntary halts, interruptions, sudden releases and complete reversals; (3) a breakdown in the more or less strict parallel phase relationship of the movements of the abdomen and the thorax.

- (b) Clinical observations regarding the stutterer's ability to speak.

Generalisation regarding the observed manifestations of the stuttering disorder is notoriously dangerous in face of the variability, amounting almost to capricious inconsequence, of the phenomena occurring even within the individual case. Founded, as more often than not they have been, upon a false conception of the process of normal speech and a wholly erroneous view of the disorder, attempts to sum up the facts which did not go beyond mere description have been worse than futile. Although something of the kind may conceivably be true in rare cases, it is ordinarily in dealing with stuttering children impossible to say that he has difficulty with this or that sound more than another. The sound upon which he blocks persistently today may tomorrow occasion no difficulty whatever. Cases of "focalised stuttering" may occur, but I have not seen them. The stutterer has difficulty in speaking, /

speaking, but to say that he has difficulty with this or that elementary speech-sound entirely misrepresents the actual appearances. Repetition of this or that initial letter, although the most commonly recognised manifestation of the disorder, is only one of the innumerable phenomena of the disturbance. It does not mean that the stutterer has difficulty with the sound that he repeats or even with the sound that follows. He may, indeed, repeat syllables, words, or whole phrases in exactly the same way as he repeats an initial voiceless explosive. In fully developed stuttering the whole progressive act of speech is disorganised and disturbed. Following von Monakow and Henry Head, Travis says: "The complete act of speaking in its normal form demands the mobilisation in proper sequence of a series of complex procedures wherein the time relation is of fundamental importance. A lack of chronological exactitude will throw the whole performance out of order. Speech is the expression of a dominant kinetic rhythm. The symptoms of stuttering represent various inconstancies in the progress of the forward-moving process of speech. In one sense stuttering may be thought of as a disturbance of rhythm in verbal expression. Hence we may say that there is just one fundamental symptom of stuttering - broken rhythm". In some /

some of the cases (cf. No. 20) almost the only, and certainly the most prominent, feature of the disorder consisted in a disturbance of those elements of speech which subserve the rhythm of the progressive act of expression. In a few, it persists, almost as if it were a constitutional defect or disability, even when the child is allowed to read in time with someone else. Although this is by far, the simplest situation for most stutterers, there are some stuttering children who seem to find such concerted reading more than usually troublesome. In the notes on Case No. 76 in the present series, we find, regarding the boy's performance in reading along with the examiner, the following: "It was very difficult to get the boy to read in time with the other voice. He failed signally to catch the rhythm of the verse, tended to read ahead, and then to become blocked. Involuntary release of air from the lungs still persisted, and breath was taken in spasmodic gasps. The performance improved with a little practice, but on this first attempt was never more than fairly good".

The special significance of the social situation of the moment in its profound effect for better or for worse upon the stutterer's powers of expression has been frequently noticed. Fletcher has built upon it a whole explanatory theory. But the results of the present investigation, /

investigation, while enabling us to say with some degree of definiteness which situations are in general likely to cause the stutterer the greatest degree of difficulty, suggest that even here everything is less certain than some have ^{maintained.} ~~suggested~~. Ordinarily, and in the absence of special influences, such as misdirected attempts by the parents to suppress the disorder, the stuttering child finds it most difficult to speak under the conditions of the school class-room, somewhat less difficult at home, and least difficult of all when he is talking to, but not before, his contemporaries in his play-activities. The more a situation arouses apprehension, the more it impels the stutterer to adopt a "self-conscious" attitude (which is a misnomer for an attitude of which the chief characteristic is painfully-toned consciousness of the other person), the more likely is he to stutter. But in children at least the disorder is seldom linked to any specific situation or even to any type of situation. Under test-conditions at the Clinic several of these children failed to stutter at all. It was on the other hand almost impossible to devise a single situation which would make free speech a probability in every case. The only one which met the requirement was that of reading in unison with the examiner, and even here a few children experienced /

experienced some initial difficulty. The indications of this study are that it is quite untrue to say that the stutterer can always read freely when he is alone. In at least twenty of our cases some degree of stuttering persisted under conditions in which probably not one of those twenty so much as suspected that they had an auditor. Certainly in the majority of the cases the disorder did disappear when the examiner left the room, under pretext, and in nearly all it diminished considerably. In a few, however, (v: Cases 55, 67, 76, 77, 78.) it was scarcely less severe than it was under ordinary conditions of communicative speech. The danger in all theories of stuttering is that of exalting a single symptom as the primary cause of the disorder. The speech of the stutterer is peculiarly sensitive to the conditions in his environment at the moment, including the attitude of the person to whom he is talking. As it is with the aphasic, so is it also with the stutterer. One person can help him whilst another produces an inhibitory effect. But it is impossible to conclude that the social situation or the stutterer's attitude in it is the fundamental ground of the disorder.

An attempt was made in this study by means of a simple vocabulary test (Burt's Graded Vocabulary) and a passage /

passage of continuous prose, to gauge the effect upon the stutterer's speech of material of different degrees of difficulty, and of these two different kinds. Interpretation of the indications, which here again vary very considerably from case to case, is rendered uncertain by various intrusive factors. Even in a vocabulary test consisting of isolated words of gradually increasing difficulty, it is not always possible to say definitely why the stutterer should have stuttered over one part of the test and not over another. In particular, once it has appeared during the reading of a set passage, stuttering tends to recur or persist, and especially in those cases which manifest serious disturbance of breathing, difficulty is nearly always cumulative and in consequence more severe at the end of the test. With these qualifications, however, we may state the general finding that stuttering is liable to be increased directly by the difficulty or unfamiliarity of the material to be read. In case after case the simple monosyllables at the beginning of the vocabulary test gave no trouble at all. It was possible even for the younger subjects to treat these as mere sounds, psychologically almost on a lower level than Hughlings Jackson's "detonating commas". The performance of the individual subject on the two tests was far too variable to warrant any conclusion. Although the /

the disorder, in accordance with expectation seemed to be less prevalent during the reading of the isolated words than in the reading of continuous prose, the condition was in some cases simply reversed.

In the responses to the Herring Revision Tests of Intelligence one striking result was early apparent. Test 4 (Digits Backward) presented no difficulty as regards mere speech to most of the subjects, and even some of the most severe cases of stuttering tested, succeeded in repeating these series of numbers, up to as many as seven or eight digits backward without a trace of the disorder. The reason for this is not obvious. The test is not one of mere repetition, since the series as read aloud by the examiner is reversed in the subject's response. Nor is it always possible for the stutterer to repeat at command. The stuttering child who repeats freely the words "give" and "penny" not uncommonly baulks at both when they are incorporated in a sentence, "Give me a penny", which is similarly presented for reproduction. The interpretation of the result of this test is no more easy when it is considered along with the similar, though less marked, and somewhat less regularly occurring facilitation of speech on Test 2 (Number Series). In this test where the child is required only to give the two /

two following numbers in a presented series, not a few of these stuttering children chose to read aloud the whole series in each case, triumphantly added the two numbers at the end, and did not stutter at all. But all of those children retain a certain amount of free speech even when it is only the "Yes, sir" and "No, sir" of cases so severe as to be otherwise almost inarticulate. Many of them have no great difficulty in replying to the common simple questions of the routine examination regarding their name, age, school, class, and the like. Not a few of them who have real difficulty in ordinary conversation can handle the small coin of polite conversation - "Good morning", "Good afternoon", "Good-bye" - with a fair degree of ease. Here the stutterer resembles the aphasic patient in that the higher and voluntary aspects of speech tend to suffer more than the lower or automatic. Impulsive speech or "linguistic reflexes" may present no difficulty to the stutterer. For the same reason he may have much greater freedom of speech under the influence of strong emotion. Quarrelling or arguing excitedly he sometimes acquires an unaccustomed fluency.

Not the least surprising observation during the examination of this series of nearly eighty cases was that of the almost complete absence of the commonly described dispersed /

dispersed manifestations of the disorder in the form of distressing overflow movements during the stutterer's abortive efforts after articulation. In all but three of the cases these movements and the maniacal expression described by Kussmaul in lurid terms were entirely absent, and in one only were they pronounced and distressing. Fröschels is probably correct in regarding these as a manifestation occurring if at all only in the earlier stages of the disorder and as a general rule suppressed by the sufferer himself in all but the less intelligent or more uneducated cases in deference to social pressure. It is significant that the only two children amongst our cases who manifested these movements to any pronounced extent and in musculatures not at all related to the mechanism of speech were of definitely subnormal intelligence. In the others the manifestations were limited to blinking of the eyelids, nodding the head, and those movements of the hands which are to be regarded less as overflow or discharge manifestations than as Begleithandlungen, as Fröschels calls them, or auxiliary movements expressly intended to facilitate the stutterer's impeded utterance.

Although the range and nature of the investigation do not allow us any definite insight into the course of development of the disorder, observations were possible which go some way to confirm Fröschel's description of that /

that development as a progress from gentle clonic to severe tonic manifestations. The latter are never present in the young child who has just begun to stutter.. The principal agent in altering the superficial appearance of the disorder is the will of the sufferer himself. In the effort to bring under control an apparatus which, in spite of his best efforts, refuses to be ruled, he directs his attention upon the movements of articulation so that the later developments in the disorder give evidence of this struggle for mastery. The severe inhibitions, blockings, and tonic cramps of the adolescent stutterer, the strained expression and rigid posture, are the expression of this misdirected effort after control. It is generally found by those who are attempting to deal with the disorder therapeutically that stuttering is always accompanied by a marked degree of muscular hypertonicity. This is undeniably true of all older stuttering children and of cases of the disorder which are of long standing. From the few cases I have seen of incipient stuttering in early childhood I am prepared to doubt whether the tension is equally pronounced in the early stages of development of the disorder. It is impossible to regard the disorder of stuttering either in its inner psychological aspects or with respect to its overt manifestations as a static condition. /

condition. The different characteristics of the speech disturbance at different times are in part at least the expression of the sufferer's reaction to and his attempt to gain control over his disordered utterance. It is possible that the course of development is more rapidly covered by the more intelligent stuttering individuals.

There are indications in not a few of the cases that the disorder is characterised by a degree of periodicity or fluctuating severity. Apart from an interval of latency which seems to occur in a number of cases soon after the onset of the disorder, it may in milder cases, diminish markedly for a few days or weeks at a time. Any factor acting to lower the general nervous tone is likely temporarily to increase the severity of the disorder, and influences which act to improve the general condition of the nervous system may, other things being equal, diminish it. If psychological factors play a part in such temporary amelioration of the disorder, they are seldom superficially obvious in the individual case. In a very small number of the children examined in the course of the present enquiry, there is some slight evidence that the stuttering diminishes during the period of the ordinary holidays from school.

Fourteen or approximately 18 per cent of our cases showed more or less pronounced defects of speech apart from /

from the stuttering disorder. Of these children seven were definitely subnormal in intelligence, having in every case a mental ratio below 90 per cent. The defects noted were as follows:

Persistent infantile speech	4
Interdental lisp (s and z)	2
Dropped aspirate and other defects of articulation.	1
Uvular r.	1
Lateral lisp	1
Sigmatism	1
Defects of articulation	3
Rhinolalia (Cleft Palate)	1

8. Analysis of the Medical Reports.

The results of a physical examination, specifically instituted as part of the present investigation, are available for 57 out of the total of 78 children. The examination was conducted throughout by a member of the School Medical Staff who was not a psychiatrist.

(a) Condition of the Nose, Throat, and Mouth.

No one now believes that stuttering is the result of enlarged tonsils and adenoids per se, but in consideration of the individual case of any speech disorder it is impossible to neglect the condition of the peripheral mechanism of speech. Apart altogether from mechanical symptoms arising from hypertrophy, malformation, and pressure, the reflex nervous effects of such conditions among structures of the face must be taken into account.

Boome and Richardson, accepting the asserted relationship between adenoids and the stuttering-disorder, have remarked that "it is not the physical factor that makes adenoidal children stammer (stutter), but the psychical". The question of post-operative shock will be considered later. The different conditions noted in the present investigation and the frequency of their occurrence are enumerated in Table VIII.

	No.	Per cent.
<u>Presence of enlarged Tonsils or Adenoids.</u>	25	44
<u>Presence of Nasal Obstruction.</u>		
(a) Deviated septum.	8)	
(b) Adenoidal.	3)	42
(c) Coryza.	2)	
(d) Unspecified.	11)	
<u>Structural Abnormality of teeth.</u>		
(a) Crowded mouth.	3)	
(b) Evidence of rickets.	2)	30
(c) More than 3 teeth carious.	4)	
(d) Various abnormalities of conformation.	8)	
<u>Structural Abnormality of Palate.</u>		
(a) Cleft Palate.	1)	58
(b) High-arched and Gothic.	32)	
<u>Structural Abnormality of throat.</u>		
(a) Shortened uvula.	1)	2
(b) Bifid uvula.	1)	

TABLE VIII.

Nose, Throat and Mouth conditions in
57 stuttering children.

In addition to the number of children (25) in whom the presence of tonsils or adenoids was noted, there were 19 cases /

cases in whom these had been removed by operation at some time prior to the examination. In one half of the cases in whom they were reported to be present, they are noted as only slightly prominent. Of the various nasal obstructions, 9 cases are reported in which they are no more than slight.

The most striking of the figures in the table is that of the cases showing the high-arched or gothic palatal conformation, amounting to 56 per cent of the total number. This occurrence of abnormalities of palatal structure in stutterers has already been remarked upon by Berkham, referred to by Fröschels, and their occurrence appears to demand an explanation. Competent medical opinion is uncertain and divided in its interpretation of the various idiosyncrasies and abnormalities in the shape of the hard palate. It is commonly asserted that the shape of the palate depends on the nasal cavity of which it forms the floor. If this were so, conditions of hypertrophy or abnormality in the latter would determine irregularities in the palatal arch. Others have believed that the abnormal structure is the result of persistent thumb-sucking - a suggestion which, if it could be proved, would be of significance for the psychoanalytic interpretation of stuttering. The abnormal palatal structure has /

has been discussed by Clouston from the somatic-psychiatric standpoint as a "stigma of degeneration", or evidence of neurotic predisposition. The argument is based upon two grounds. On the one hand the high-arched or, as he calls it, the neurotic palate is unusually frequent amongst cases of mental disorder and nervous instability. On the other, since the size and shape of the skull in growth is dominated by the brain, it is supposed that cerebral development will secondarily determine the shape of the upper maxillary bone and the palate, in such a way that a neurotic heredity will have an opportunity of manifesting itself. None of the three theories is wholly acceptable, and the last is on the face of it unlikely to find much favour at the present time.

The question of the significance of palatal abnormality in relation to the stuttering disorder must be left open.

(b) The Nervous System.

Investigation here was directed primarily to determine

- (1) the state of the pupils in respect of
 - (a) dilatation or contraction, (b) reaction to light.
- (2) the presence of deafness.
- (3) the presence of tremor.
- (4) /

- (4) the extent and vigour of the knee-jerk:
whether exaggerated or diminished.

and in relation to these

- (5) the state of the skin in respect of dampness
or dryness.

Mere tabulation of the results of the examination is quite worthless. The only specific point of importance that emerges is that of the 57 children examined only three (or rather less than 6 per cent) showed any appreciable degree of auditory defect. In none of them was the deafness severe and in none could it be considered as in any way related to the disturbance of speech.

From the psychiatric viewpoint the information elicited under the present heading acquires its special significance for the interpretation of the stuttering disorder and for the understanding of the individual case in so far as it provides evidence of the presence of the symptoms of anxiety. The judgment as to whether the individual case is in a state of anxiety or not does not depend upon the observation of any or all of its somatic manifestations, but where these are ascertainably present, diagnosis upon the basis of psychological findings will be the more securely grounded. The significance of this anxiety in relation to stuttering can be more appropriately discussed in connection with the problems raised by /

by the psychological examination proper. We are here concerned only with the occurrence of the physiological signs of the psychological disturbance - the extreme dilatation of the pupils, the existence of neuromuscular tremor, the exaggeration of the patellar reflex, or the relative dampness of the skin. While one or other of these manifestations is present in more or less pronounced form in a large number of our cases, in barely one third of them is the combined evidence of the different indications sufficient to warrant a strong suspicion of a positive conclusion. The discussion is postponed.

9. Some Significant Points in the Developmental History of the Stuttering Child.

In this and the following sections no suggestion will be made which is not expressly qualified as tentative. Apart from the universal difficulty of obtaining full and accurate information when investigation is carried back to the beginning of the child's development, from even those mothers whose insight is above the average, the present research is open to criticism in so far as it deals with that earliest stage of his career. In many of the cases only a single interview with the mother was possible, and circumstances required that it should be rapidly carried through. But it is the rule rather than the exception in clinical work of this kind, that the mother as well as the child /

child should take some little time to become accustomed to the examination, so that the most significant facts may emerge, sometimes when they have been supposedly forgotten, almost by way of abreactive discharge, during one of the later interviews. Further, the possible real significance of some of the points became apparent only as the investigation proceeded, so that valuable indications in certain cases may have been overlooked. For a variety of reasons, therefore, the ascertained incidence in the stuttering group of nearly all of the points which will be noticed is probably lower than it really is. Six of the cases where it was impossible to see the mother herself will be disregarded here, so that we are properly concerned with the findings in the examination of 72 stuttering children.

(a) From Birth to Weaning.

Recent discussion has suggested that it is necessary to consider even the foetus as falling within the scope of developmental psychology, and to take account of the conditions promoting or impeding the growth of the already living organism at a point where the shifting frontier-line between heredity and environment becomes blurred and indistinct. Inheritance is not the only agency at work to determine that a nervous mother should have /

have a nervous child, and external influence may begin to play a part when it is least suspected and its action little understood. It may not be without significance, therefore, that in at least 14 of our cases (or approximately 20 per cent), the condition of the mother in the period immediately prior to the birth of the child left something to be desired. Unsatisfactory conditions noted in these cases were: a low state of physical health, more or less extreme nervous expectation, especially where the child was the first of the family, and acute anxiety induced by contemporaneous circumstances or actual traumatic experiences. The number might well be increased by inclusion of several cases where in post-war homes economic conditions, unemployment and the like, were responsible for an unaccustomed degree of insecurity, if not of actual privation.

In no less than 25 or fully one-third of the cases, birth itself was more than usually difficult, or finally accomplished after prolonged labour or with instrumental assistance. Definite evidence of injury is available in only one case of intra-ocular haemorrhage. In two birth was premature. The specific significance of difficult birth, in the absence of actual injury, is not easy to assess. Even the most normal birth, under the best conditions /

conditions is the occasion of the first and most radical environmental change in the career of the living organism and as such its importance has probably been underestimated alike by medical writers and psychologists. Freud believes that the primal transition has become the prototype of all the situations which will later give rise to anxiety, and in which its widespread painful experiences will be reproduced. Birth on this theory is the primary psychic trauma which takes its effect upon the two organic systems of respiration and circulation, so that historically considered it represents the source of the symptoms of the later anxiety state. The dyspnoea of the sufferer from morbid anxiety is the dyspnoea of birth. It is possible that the disturbances of respiration in stuttering might find their symptomatological significance in this connection as the central anxiety-manifestation of the disorder. Regarded, however it occurs, as a trauma, birth which is accomplished with more than the usual degree of difficulty can be readily understood as taking the individual the first long step on the road to future "nervousness". Failing some such interpretation as this only two others seem to be possible. The one is that which would be required by Travis's hypothesis regarding the origin of stuttering, namely, that /

that cranial pressure in such conditions leads to such a disturbance of cerebral physiological function without specific lesion that disorganisation of neuromuscular function in speech will result. The other is a piece of physiological guesswork which I have never seen suggested, and the mere possibility of which I am not competent to assess. Under abnormal birth conditions establishment of automatic respiration may be accomplished only with great difficulty. Even in the normal child according to the researches of Carramausel, it is not fully stabilised during sleep at least until a month after birth. It might be that in some cases of difficult or abnormal birth, respiratory disturbance thereby induced persists^{Si} in such a way as to give rise to disordered speech.

The time of the infant is occupied chiefly by sleep, punctuated by gradually lengthening intervals of wakefulness during which it may be fed. Sixteen, or fully 20 per cent, of our stuttering children are described as having been abnormally restless, fractious, irritable or simply sleepless babies during the first year of life. In three of these convulsions are reported. The nervous "temperament" makes its appearance at an early stage, and perhaps in nothing more than this disturbance of the normal rapid rhythm of sleeping and waking during the first months.

The psychology of early childhood is still deplorably inadequate and the body of established opinion regarding the various phenomena that appear at different stages still meagre in the extreme. But the clinical psychologist is compelled to take into account the earliest manifestations of activity which demand interpretation if only in order that we may understand the significance of abnormality of function when it occurs. The Freudian school have emphasised the importance of infantile sucking from their particular viewpoint, and in the psycho-analytic interpretation of stuttering, as expounded by Coriat the manifestations of this infantile activity have a peculiar significance. The infant's behaviour in sucking certainly gives rise to the first possibilities of observation of individual tendencies, even during the first three months of life. "Some (infants) present a picture of a suffering, impatient, greedy imbiber, while others indulge themselves in the realm of the ever-existing 'animal gluttony' (Perez), ranging up to the relatively indifferent, calm, real and joyous activity. The accompanying motor processes of drinking, pressing, hitting, holding, scratching the breast with the hands, may be dependent upon the intensity of hunger, and differ according to the momentary mood. Nevertheless, here also some of the characteristic habits seem to develop /

develop early. In pleasure-sucking particularly individual behaviour habits develop". (Bernfeld). If there be any foundation at all for the theory of stuttering as an "oral neurosis", determined by repression and fixation at the oral stage of libido-organisation, then we might expect to find recognisable anomalies in the nutritional activities of the infant or in its management by the mother or nurse. The source of the trouble should lie in the dual nature of the instinctive act in so far as it is directed first to the satisfaction of the primary organic need, and in addition acquires a secondary motivation in the satisfaction of a specific pleasure in the activity itself. According to Freud this instinctual pleasure in sucking for its own sake which, as it develops, gathers independence of the satisfaction of hunger, is the primary libidinal or sexual pleasure.

There are indications that from the beginning sucking is to a certain extent independent of hunger: the new-born child will suck his finger within the first hour of life during which insistent hunger is hardly probable. As the striving after the specific pleasure of the sucking act gathers strength, direct effort which no external factor is strong enough to check will be made to obtain and to perpetuate it in isolation from the activity of feeding. Interference with or repression of the libidinal /

libidinal striving will induce the fixation and establish the point of arrest to which the later neurosis, if it develops, will return. Hence the support which the analytical conception of stuttering finds in the observation of Dr. Cameron of Liverpool that the child who later becomes a stutterer has difficulty in feeding during his early days - difficulty, that is to say, over the act of sucking. But specific difficulty in the act of feeding is only one way in which the fixation may be set up. Whether feeding has been carried out by breast or bottle there will be scope for a wide variety of experiences in connection with the act of sucking in accordance with the varying characteristics of the mother or the nurse who is in charge of the child. The conditions of repression and fixation may then appear under two different forms. On the one hand they may arise in the event of abnormally strong repressive agencies - unusually aggressive interference, for example, on the part of the mother with the manifestations of pleasure-sucking - taking effect upon a not excessive drive. On the other the inhibiting factors may be no stronger than normal, but the instinctive urge itself may be excessive. In enquiry directed to obtain information from the mother regarding the child's early feeding experiences, it is naturally difficult to establish evidence of deviation from the norm in her own practice, even /

even in cases where there is strong suspicion on the basis of her manifest characteristics that it may have been effective. But clear indications of difficulty in sucking or of the child's own persistence in the activity can readily be obtained by the ordinary methods of enquiry. I find that 12 of the 72 cases under consideration here, or approximately 17 per cent, show definite indications along one or other of these two lines. The proportion is perhaps not superficially excessive, but under more stringent examination it would almost certainly have been increased. Of the ~~twelve~~ cases found six are described in various terms by the mothers as ravenous babies, "greedy feeders", impossible to satisfy. In fact in some of the individual cases the facts are striking, e.g.:

- (a) Case No. 37. Never breast-fed. Bottle over a long period during which he had little solid food. He was fed principally on milk and Robinson's Patent Barley until he was about $3\frac{1}{2}$ years old. He would not give up the bottle until then and refused to take milk from a cup..... A comforter was used until he was about 18 months old, and for a long time he continued to suck his thumb. He bites his nails and seems to chew the tips out of the fingers of his gloves.
- (b) Case No. 72. Difficult Birth. Born "blue". For some time he was not expected to survive. Breast fed for four months but did not thrive.. At first he was difficult to feed because the milk was regurgitated through the nose. After breast-feeding was discontinued he was given Allenbury's /

Allenbury's (No. 1) Food by bottle, at half-strength in order that he might digest it more easily. Weaning was begun before the end of the first year but had to be discontinued and the child returned to bottle-feeding at 12 months when he was seriously ill with pneumonia. The illness was a severe developmental set-back.

If the psychological development of the first year may be regarded as beginning with the trauma of birth, from the same analytical standpoint, the period will come to an end with the frustration of weaning. "Weaning", Bernfeld says, "is to be considered as a significant frustration which applies to the oral group of sexual instincts and to which the child reacts, after a short rebellion of rage and defiance by withdrawing the libido from the disappointing object through projection and repression". But whether it be considered from a Freudian viewpoint or not, the process of weaning must be regarded as necessitating a transference or repression of a firmly established impulse which, if it is not smoothly consummated, may leave behind a disposition for or be the actual starting-point of many faulty developments. Evidence of extreme maladjustment to or during the weaning process was not elicited in many of our cases, but in a few it was marked. The two cases just quoted reveal on the one hand, an extreme reaction against the process of weaning in which the child's impulse was allowed to rule; /

rule; on the other, an interrupted and irregular weaning, disturbed and retarded by physical illness. Case No. 5, suddenly taken from the breast at ten months because of the mother's illness, presents a picture similar to the former in his refusal for a week at that time to take other food. But the mother who expects a certain degree of irritability and apathy or adverse reaction to the change is only too ready to minimise or even after a lapse of time to forget the maladjustments that may have occurred unless they have found dramatic expression.

Three specific points in the process of weaning, however, ^{must} ~~fall~~ to be noticed. Whether the first of these is significant it is impossible, in the absence of figures for normal infants, to be certain, but the possible mode of its action is not difficult to conceive. The point in question is that of the apparently large proportion of these stuttering children who have ^{experienced} ~~for~~ one reason, or another, a "double weaning" by being transferred at an early stage from breast to bottle-feeding. We find that this has occurred in 25, or approximately one-third of our cases. Where this takes place at a very early stage, before the age of three months, it cannot be regarded as of great significance. At a later age conditions may be altered. Memory of taste stimuli develops very early, and /

and it has been repeatedly observed that if the infant has drunk the mother's milk, it often resists alien or cow's milk. Preyer, for example, records that when cow's milk, diluted with water was given, the child accepted only the original milk or diluted milk sweetened to taste like the mother's.

More important, however, than this must be the method and time of the final complete change. Glover has expressed his opinion that for the working out of the suckling gratification there is an optimum period with individual variation, the shortening or prolongation of which constitutes either a traumatic experience or a situation of fixation. He considers that the shortening of this period is almost invariably traumatic, while the effect of lengthening it will depend upon the stage of ego-development reached in the civilisation concerned. In the more primitive races, suckling is commonly carried on into childhood, or even later. The tendency in our group of stuttering children has certainly not been in the direction of retardation of weaning. In fifty-five cases for which exact information was obtained the number weaned at each of the specified ages was as follows: before 8 months, 1; 8 months, 3; 9 months, 10; 10 months, 17; 11 months, 2; 12 months to 18 months, 21; with /

with one case at $3\frac{1}{2}$ years. Thirty-one cases in all had been broken from the breast or bottle by the age of ten months. If, as Glover suggests, to cut short beyond a certain limit the period of gratification of the primary instinctive urge, is to run the risk of instituting a trauma, of submerging the urge instead of allowing it to be fully worked through to consummation in its primary form, the danger will be the more increased if weaning be sudden, sharp, and catastrophic. This condition obtains in 24 of our stuttering cases and especially in rather more than half of those in which weaning occurred well before the end of the first year. External consideration suggests no essential difference in their reaction to the weaning process of the bottle-baby and the child who has been breast-fed throughout.

10. Neurotic Manifestations.

	No.	Per cent.
1. Anxiety attacks.	3	4
2. Outbursts of Temper.	10	13
3. Enuresis.	15	19
4. Specific Fears and fear dreams.	25	32
5. Thumb-sucking, etc.	17	22
6. Nail-biting.	36	46
7. Feeding-difficulties.	25	32
8. Squint (?).	5(?)	6(?)

TABLE IX.

Popularly said to be the result of "nervousness",
stuttering /

stuttering is only too frequently accompanied by one or other of the characteristic elements that go to make up the syndrome of manifestations that are typical of the nervous child. As our table shows enuresis, fears and childish nightmares, thumb-sucking and nail-biting are all relatively common in the stutterer.

1. Anxiety-attacks.

Well-defined anxiety-attacks are reported in two of the cases - in the one, (Case No. 1), a boy with an explicitly neurotic heredity, taking the form of sickness and the typical cold sweats; in the other (Case No. 63) of a more or less severe dyspnoea. In the third case (Case No. 61) all the indications point to a similar interpretation of the "fainting-fits" reported.

2. Outbursts of Temper.

These are observable, as might be expected, most frequently and most distinctly in those cases in which there are unsatisfactory conditions in or a more or less pronounced maladjustment to the home situation, the latter being of not infrequent occurrence in our stuttering group. The manifest trait of stubbornness, which is not seldom very marked in the stuttering child, very readily brings him into conflict with parental authority, and his too highly developed sense of justice, or of his own /

own rights as an individual, may render him a difficult member of the family. Typical cases are:

Case No. 20. Defective home relationships.

The boy is an illegitimate child, the father having disappeared before he was born. It is very doubtful whether his mother is married to the present step-father, by whom she has two children. The household consists of the mother and step-father, (unemployed); Alex, aged 11 10/12, the only stutterer in the family, his two step-brothers, aged 22 years and 18 years; his two half-sisters, aged 8 years and 5 years. The relevant abstract from the clinical notes on the case is as follows:-

"The parents agree that he has a bad temper. He is said to be nervous and cries at the slightest check or restraint. At a harsh word he flushes and goes off alone. He has not been much punished because 'he goes into a fit if he is'. In a temper-tantrum he lies down and bangs his head on the floor, and is ready to hurl the first available missile at the object of his anger. He flares up on the slightest provocation. He fights with his next-younger sister. He obeys his step-father, but is more apt to be troublesome about his mother's orders. (From the apparent nature of the two people - the mother is a far more aggressive scolding type - this is almost certainly a reaction to the way in which the orders are issued). He becomes very angry if any of the others touch his belongings, and he is not infrequently teased by his older step-brothers who hide his books in order to excite him to a temper".

and in typical marked contrast to the foregoing:

"He does not play much outside the house and rather tamely allows other children to hit him. He was even more cowardly when younger, and 'howled for the least thing'. He could never stand up for himself, but called for his mother as soon as he found himself in trouble".

Case /

Case No. 77. The Unwanted Child. Aged 11 10/12. Two sisters, aged 21 and 20. One brother, aged 16. The mother is suppressed and anxious. She was 37 when Dorothy was born. It became apparent only some months after the first interview that the mother was more than anxious to transfer the responsibility for a difficult child to other and more competent hands, so that steps were taken to have her removed from home. The child's whole attitude is characterised by an extreme anxiety, which manifests itself chiefly in connection with school. At times speech becomes almost impossible for her. The relevant notes are:

"At home she has a 'terrible temper', sullen rather than inclined to tantrums. She is on reasonably good terms with the older members of the family unless they ask her to do something, when she is apt to refuse outright. She sulks if she is scolded, and sometimes flares up..... Although she is sometimes quite amenable she is very stubborn and cries readily if she does not get her own way".

3. Enuresis.

"Incontinence can be present as the result of mental conflict, as the non-specific expression of an emotional disturbance, or, more directly as a self-assertive phenomenon and sometimes as an erotic one". (Gillespie, quoted by Boome and Richardson). The significance of enuresis as a neurotic manifestation is seldom underestimated. In stuttering children, apart from its actual frequency, it is the more striking by contrast with their commonly more than ordinary personal scrupulousness and almost fastidious sense of propriety. The frequency with which enuresis appears also amongst those /

those brothers and sisters of the stutterer who themselves manifest no speech disorder while the stutterer shows no incontinence may be an indication that the nervousness is less often concentrated in the one member of the family than might at first sight appear.

4. Specific fears and fear-dreams.

A survey of this kind was scarcely adapted to lay bare the deeper fears of the stuttering child, those most commonly reported being fear of the dark and of being alone. But the significance and the frequently widespread distribution of fear and its neurotic analogue, anxiety, in the stutterer were frequently thrown into clear relief by even the few meagrely reported dreams which the child was able to remember. The reports of Case No. 69, an excessively nervous girl, and Case No. 29, a boy whose attitude was characterised by a marked strain of hypochondria are illuminating.

Case No. 69. She says that she is afraid of
 (1) being alone, (2) meeting men in the dark,
 (3) knives, (4) going in trains and buses,
 (5) traffic in the street, (6) germs and illness,
 (7) school. (The girl's mother is also extremely nervous, and becomes afraid when she travels in a bus or a train).

The girl gives examples of her dreams as follows:

- (1) Anxiety dreams about school, e.g., about failing in her work and about being punished.
- (2) Dreams about dancing - pleasant dreams.
- (3) /

- (3) Dreams about drowning. (She swims and likes swimming).
- (4) Dreams about her mother, her uncles and her aunts.
- (5) Anxiety dreams about wild animals.

Case No. 29. Age 12 10/12. He reports dreams as follows:

- (1) Dreams about being chased by wild animals or big bullies. In these dreams he would run away and jump over a fence or wall. He would often wake up with a jerk. After such dreams he was at first unable to remember what he had been dreaming about, but in a few minutes the dream would come back to him.
- (2) Dreams about being trapped in a bear's den.
- (3) A dream about Jack o' London (a murderer in a film he saw), coming into his room and saying, "I'm coming to get you".
- (4) Dreams about woodwork and making all sorts of things. (He wants to be a carpenter).

5 and 6. Thumb-sucking and Nail-biting.

Taken together these two are by far the most common of the concomitant nervous symptoms occurring in the speech-disorder. For the analytical interpretation, however, they have a peculiar significance as manifestations of the same libidinal fixation which is supposed to lie at the root of the disorder. Both point back to fixation at the oral stage of the libido-development although to different stages within its point-to-point progress. They are directly connected with the period of /

of the oral fixation since thumb-sucking at least may be and, whether the analytical interpretation be in detail acceptable or not, frequently^{is} intensified as a means of substitute-satisfaction at the very time when during weaning, external repression is most suddenly and violently applied.

7. Feeding-difficulties - the frequent symptoms of the nervous, 'difficult', child. In all of the cases in whom these have been recorded, there has been either a periodic refusal of food, a display of marked likes and dislikes, and irrational rejection of certain types of food, or a history of digestive disturbance which is found by the mother to vary concomitantly with the child's nervous condition (vide Cases Nos. 53 and 77).

8. Squint.

There is evidence to show that squinting may appear as an expression of underlying emotional disturbance or as a quasi-hysterical symptom. Inman found a definite relationship between left-handedness, stuttering, and squinting in his examination of a series of cases showing the ocular distortion, and upon investigation of the members of their immediate families. He is of opinion that squinting may be itself the result of fear, which he regards as the root of the speech-disorder. In some of his cases the squint appeared to have been produced /

produced by parental severity. . The child was cowed and shrinking and the squint might suddenly disappear with the restoration of confidence. . Whatever be the meaning of the symptom, it is certain that a squint, usually varying considerably in degree from time to time, appeared in a small number of these cases. . In a few, where the observation was too uncertain to allow us to count them as squinting, a slight ocular deviation seemed to be apparent on the occasion of the first interview, but failed to reappear later. . In one boy squinting was remarked upon by his teacher as occurring only during his attempts at speech, and in several of the cases noted it varied not only from one visit to another while they were in attendance at the Clinic, but from moment to moment during a single interview.

The specific significance of all the phenomena which have been noted here is dubious but not, perhaps, immediately important. . Clinical investigation is still required in order that they may be satisfactorily elucidated. . But their relative frequency in the typically strained and nervous child, suffering from internal conflict, inadequacy or maladjustment in face of environmental demands, or emotional disturbance of one kind or another is not in doubt, and their prevalence in our stuttering group has its own tale to tell.

But the commonest and most important of the neurotic appearances in the stuttering child has been omitted from the table and from the foregoing discussion, namely that of anxiety. "Stammerers (stutterers), write Boome and Richardson, "are never wholly free from fear, although many are so unconscious of the emotion as to deny its existence". It is probable that the assertion scarcely overstates the case, and it is more accurate regarding the mode of manifestation of the painful affect than the common vague belief that stuttering is a form of fear-neurosis. Fear, consciously appreciated as such, comes to the surface far less often, in the stuttering child, than many people believe, and when it does so, it is probably seldom fear of speaking in itself. The younger child does not adopt the same position towards and frequently seems to reveal a different attitude to his disorder from that of the adolescent or adult stut-terer from whom most of the introspective accounts have been obtained. In these latter the fear of stuttering which may be marked and very distressing is a developed phenomenon as the acute sense of their disability and their differentiation from their fellows grows upon them.

In his striking book, Because I Stutter, in which he describes his own painful experience of the speech-disorder, Wendell Johnson has the significant passage:
 "This /

"This fear of stuttering consists chiefly in the anticipation of difficulty, and it arises from the fact that stuttering has been known to occur before. It does not cause stuttering, rather it is caused by stuttering that has occurred in the past". In its more extreme manifestations this completely conscious and established fear may become the basis of severe disability and even more undesirable specific reactions. Amongst his juvenile delinquents, Burt found cases in whom direct reactions against the sense of shame and the feeling of inferiority, indefinitely augmented by the presence of a stutter, found expression in retaliatory assaults and even suicidal threats and endeavours. But even when it does not find dramatic expression in violent outbreaks of this kind, the fear induced by stuttering, whether or not it is from the outset coupled with any minor actual or felt inferiority, may culminate in antisocial jealousy and Ishmaelitism, or in very real inhibition of initiative. In a few of our older children this process is already at work (vide Cases No. 17 and 69). In some of the others it makes its appearance in various forms of compensatory aggression, directed against the younger members of the family.

But this overt fear, as we are tempted to call it, is not the primary or principal fear-component in the affective /

affective syndrome of the stuttering disorder. Whether it can be said that the central core of the complex of emotions is always a nucleus of anxiety is not certain. But that some form and degree of anxiety is present in a considerable number of the cases is not in doubt. As we have already seen, it was possible on the basis of the physiological symptoms alone, as discovered under medical examination, to be reasonably certain of the presence of anxiety in some thirty per cent of the cases. Psychological examination serves in most of these to confirm our suspicions, and to raise the proportion of cases showing some degree of anxiety to a figure nearer to 50 per cent. Even in this rapid survey, and despite the difficulty of direct investigation of the emotional life of children most of whom were under the age of 12 at the time of the examination, evidence of the presence of anxiety, or of irrational fear not specifically related to the act of speech was obtainable in some forty of the cases. Almost unquestionably the estimate is a conservative one, but in respect of this trait it is wiser that it should be so. Every child is in a measure unbalanced, as being a child and not an adult. Similarly, and for the same reason, every child may be expected to show some degree of real anxiety, so that diagnosis can only be made with /

with caution. But children are not all equally apprehensive, and the children who are more than usually timid in face of all kinds of objects are just those who are most likely to be or to become neurotic. The neurotic disposition is betrayed, amongst other signs by the tendency to real anxiety. In the absence of any adequate stimulus this deep-seated anxiety will find an object or an unexpected way of discharge for itself. In some of the cases (e.g. Cases Nos. 20 and 35) it is fostered by the insecurity of an unstable or defective environment in the home. In many it lies at the root of the neurotic manifestations which we have already considered, or of the behaviour difficulties, minor acts of aggression, outbursts of temper, and the like, which not infrequently render the stuttering child the most difficult member of the household. In a large number of the cases the school situation and the person of the class-teacher have become points of projection and concentration for, as well as very real stimulants of the anxiety to which the child is already predisposed. The situation in the ordinary class-room, with its excessive demand for speech under unnatural conditions, must obviously be one of real difficulty for the stuttering child. Its responsibility as the principal instigator of the fear of speech or of stuttering /

stuttering as such can hardly be over-estimated, and is all too inadequately recognised by the reports of the class teachers which indicate that 20 of these children do show signs of nervousness in class. But it is even more significant that in more than thirty per cent of the children, only five of whom had shown any adverse reaction against school at the outset, a deeper and more inclusive painful concern with it is apparent. Straining and worrying over lessons, fear of failure or of the consequences of arriving late, and justified fear in some of the sadism of the educator, are all too frequent amongst those stuttering children.

When all has been said there remains in many of them an elusive element of "nervousness", a residue of anxiety which cannot be explained as fear of any single element in their environment at home or elsewhere or as a sense of insecurity externally induced or conditioned. If this be true, there is at the core of the stuttering disorder a real neurotic element related to the anxiety hysterias, ^{in the stutterer} and an insecurity or want of balance which lies deep in his own personality. The root of the uncertainty or internal maladjustment which appears to exist in a not inconsiderable group of stuttering children and to condition their attitudes and reactions is hard to come by. It /

It cannot even be taken as proved that it exists in all of them. Not the least baffling of the many reasons for the obscurity of the problem of this, the most stubborn of the speech-disorders, is that under the most careful investigation, we are left always with a remainder, a balance of cases which cannot be fitted into any scheme since they present no superficially apparent abnormality but the disorder of speech itself. Logically we might appear to be driven back on the conception of stuttering as itself a symptom, a neurotic manifestation on the same level as many of the others which make their appearance in the nervous patient, child or adult, and like them serving properly to indicate the presence of a more deeply-laid disorder whose nature it is as yet difficult even to guess. For the Freudian stuttering is an "oral neurosis" and the hypothesis includes an interpretation of the residual core of anxiety when and where it occurs. The conception of the infantile stages of libidinal organisation has proved itself of pragmatic and interpretative value in psychiatric practice, and the elucidation of the phenomena of the oral stage by Abraham and Glover has found considerable acceptance amongst those who are dealing with some of the more highly abnormal conditions, such as melancholia. If we accept their theories, the stutterer, like the melancholic exemplifies the results of repression and fixation /

fixation at the oral stage, and in accordance with orthodox analytic theory, the anxiety is interpreted as the ego's fear of the unconscious, or more accurately, of the return of the repressed infantile libido. The danger comes not from without but from within. Anxiety or chronic fear arises under certain conditions in the event of the thwarting or frustration of the primal instinctive impulse, of the libidinal striving, at whatever stage of its development it may be. If the frustration is sufficient to give rise to a real repression, then anxiety will be apparent when, and will persist as long as, the libido maintains its pressure behind the barrier, that is, in the stutterer, as long as it continues to demand satisfaction of an oral kind. The theory would cover many of the problems, but the difficulty remains, even when we understand how the repression or frustration may have come about, of showing that it has taken place in just that way. The prevalence of the nutritional neurotic manifestations in the stutterer of thumb-sucking and nail-biting, and the frequency of sudden weaning at an early rather than a late, stage, as they appear in our cases are indications of what may have happened. But the theory requires further substantiation upon these and all the points of fact that arise.

11. Some commonly accepted causative factors
in the initiation of stuttering.

It is generally asserted by clinicians and others that stuttering in children commonly arises as a result of a shock or a physical illness. So far as our cases are representative, while this immediate relationship does hold in a small number, it is not of very common occurrence. The mother of a stuttering child is only too willing, under clinical examination, to trace the onset of the disorder to some such event, not excluding the classical blow on the head. Few of them, however, will maintain with complete certainty under closer enquiry that there was no manifestation of the disorder before that time. Our cases afford no support for any attempt to apply the theory generally. Making every allowance for the fact that the child himself could remember nothing of any traumatic occurrence at the early stage at which stuttering ordinarily sets in, even the parents of our cases seldom suggested that the disorder had arisen in this way. In only one of our 78 cases is there unequivocal evidence that the speech-disorder set in as the immediate result of a fright. In this case (No. 15) the boy spoke well until he was four years old at which time he had a severe shock, as the result of a frying-pan blazing up very close to him. "The child went white, shuddered and roared, and for /

for a short time was unable to say anything articulate". He is said to have stuttered from this time. No other cases of stuttering are reported in the family. Only one other case is recorded in which there is any suggestion that the disorder was causally connected with an experience of fright, and here all that the mother can say is that about the age of six, when the stuttering first manifested itself, the child was terrified by a passing fire-engine: In this case there is a history of very retarded speech development in the father's family, and one brother, thirteen years older than the stuttering child herself, stuttered while he was at school but had apparently recovered before she was born.

Two cases of stuttering following upon operation shock are reported - the one after removal of tonsils and adenoids at seven, the other after extraction of teeth under an anaesthetic at the age of five. In the latter case (No. 34) one maternal uncle who was also left-handed is known to have stuttered, while the boy's father has a partial stutter. This developed in his case after treatment for complete aphonia which was set up when his ship was torpedoed during the War.

In four cases the speech-disorder is said to have appeared after illness as follows:-

- (a) Case No. 28: after Scarlet Fever at $2\frac{1}{2}$ years of age.
One /

One brother, 16 years older, stuttered but recovered suddenly after an accident in which his chin was pierced by an iron spike when the younger boy was two years old.

- (b) Case No. 11: after pneumonia and pleurisy at age 4. The child was ill for three months and the illness left him in a very debilitated condition. Maternal uncle stuttered at school. Mother is left-handed and stutters slightly in excitement.
- (c) Case No. 4: Uncertain - after diphtheria at age 3. History of stuttering in mother's family. Mother herself stuttered until she was 18. Father ambidextrous. Paternal grandfather left-handed.
- (d) Case No. 67: after whooping-cough at age 5. "Before then he had spoken slowly and distinctly. After the illness he began to speak much more rapidly and stuttering declared itself quite definitely when he was about 7". One paternal uncle stuttered slightly.

Clearly it is impossible in these cases to consider either the shock or the illness as the real cause of the disorder unless in cases of the former type stuttering be regarded as the non-specific expression of nervousness resulting from the fright or the operation. Otherwise it is necessary to presuppose either a specific predisposition to disorganisation of nervous control of the language function, which may become effective when vitality and the general tone of the nervous system are lowered, - it will be noticed that in all four cases of stuttering after illness there is some family history of stuttering - or else

a situation of fixation and repression upon which the shock may take immediate effect, or such that the repressed libido can steal a march upon the impoverished and harassed ego under conditions of ill-health.

Whichever of these views be the true one, however, the number of cases in which we can trace a connection between the speech-disorder and any such immediate causative factor appears to be small. It seems, therefore, as if we must regard stuttering as a developmental disorder, most commonly of gradual onset, in which the predisposition, whether it be the result of inheritance or of fixation, becomes effective in most cases under the conditions and within the circumstances of development itself.

12. The Stuttering Character.

Beyond some superficial attempts to trace the nature and direction of the sufferer's reactions to the speech-disorder, few of the writers on the subject of stuttering, with the exception of Coriat and Appelt, have made any attempt to investigate or to describe the character formation of the stuttering individual apart from its expression in speech. But the study in rapid succession of a series of stuttering children, like that with which we have been concerned here reveals recurrent traits, /

traits, attitudes, and characteristic modes of reaction which seem to be typical of these children as a group. The general impression left upon the investigator by the cases is not merely one of general "nervousness" and over-excitability but of a peculiar blending of those traits which have been distinguished by the psycho-analyst as characteristic of the "oral-erotic" and the "anal-erotic" types. Taking them in order of their inclusiveness, which coincides with that of the frequency of their occurrence in the group, the traits which we have found to be most characteristic of these stuttering children are:

1. Extraversion.
2. Egoistic narcissism.
3. Possessiveness.
4. Orderliness.
5. Stubbornness and self-willedness.

The pure types of extraversion and introversion are far more clearly distinguishable in childhood and early youth than at any later stage. Education and the demands of life tend to produce a balance in which the distinction between them becomes blurred and uncertain. But extraverted the stuttering child begins, and extraverted in most cases he remains. A few, probably the more severe cases of the disorder, become reclusive or even antisocial and resentful. But these are the exceptions and amongst stuttering children they are very rare /

rare indeed. Not more than five children in our stuttering group can be distinguished as showing any marked aversion from the activities and society of their contemporaries. Contrary to expectation, and by no means wholly or even in any marked degree as an over-compensation for his disorder, the stutterer inclines to seek rather than to shrink from social contacts. The well-worn simile of the self-sufficing introverted cat, and the extraverted fox-terrier, "busy, friendly, inquisitive, bustling about and taking an excited sniff at everybody and everything", supplies us with a description which, so far as it goes, is applicable to many of our stuttering cases. Compensation may be suspected in the stutterer's not infrequent and sometimes unjustified pretensions to leadership, but not a few of our stuttering boys have been able in various fields and in different organised activities to make good that claim in virtue of their own unquestionable capacity and their possession in a high degree of the qualities that make for such pre-eminence. Fletcher has asserted that probably every stutterer suffers from inferiority-complex, but this is far from being true of the cases that I have examined. The apprehensiveness of the stuttering child appears to be differently qualified, although in a few of the cases timidity may amount to /

to or give strongly the impression of inferiority-feeling in face of certain social situations. The cases in whom there has developed a generalised sense of inferiority or inadequacy are infrequent, and there is no shred of evidence for Fletcher's implication that such a feeling of inferiority is in a large number of the cases prior to or the cause of the disorder of speech. In several of the cases where pronounced inferiority-feeling was observable there was present some real ground of inferiority, such as low intelligence, apart from the disorder of speech itself. As the proportion of boys to girls examined was as five to one comparisons between them are uncertain. But so far as these cases may be taken as representative, stuttering girls tend far more frequently than stuttering boys to display the characteristics of timidity, diffidence, and shyness, developing in two out of the thirteen cases into an extreme degree of apprehensive distress (vide Cases Nos. 69 and 77).

The egoism of the stuttering child manifests itself in a variety of different ways. Its narcissistic component is apparent in their relatively extreme fastidiousness in matters of personal cleanliness and dress. The following notes from the account obtained from the mother of one of the children (Case No. 50, Boy, age 12 11/12) are indicative:

"He /

"He is described as 'a very strait-laced kid', extremely truthful and displaying a passion of self-explanation. He has a highly developed sense of meum and tuum and abides strictly by a promise, but is at least equally exacting in holding another to an obligation, in money and other matters. He has an abnormally marked fear of and is very ready to resent what he takes to be a false accusation. Although by nature kindly he is a very thrifty boy and keen to save money..... He is 'fastidious all through', a trait which manifests itself distinctly in various ways. Ever since he was a small child he has folded his clothes carefully on going to bed or when they are not in use, and he is liable to cause a commotion if these are removed from the chair where he has left them. By comparison with his brothers in this respect he required no training. He insists upon any defect in his clothing, such as a tear, being attended to at once by his mother. If his brothers borrow any of his clothes he is liable to refuse to wear them again thereafter

This description incorporates along with the trait of personal fastidiousness a number of others which appear frequently as isolated manifestations of the same general disposition in the other cases. We notice also the stubborn sense of justice and of his individual rights: "He would not move out of his place at table - not even if the King was coming in".

The last case might have been quoted in exemplification of another related and very prominent trait of these stuttering children, namely, possessiveness. They manifest not so much acquisitiveness, or even parsimony as a strong sense of personal ownership. They become extremely, even violently angry if another meddles with their /

their belongings, or takes possession of them. When they are generous, their generosity is partial and conditional. Describing another of the cases the mother says he is "rather a saver. Don't take anything, but ask him and he will give you his dearest possession". The spontaneous characterisation indicates very clearly the nature of the trait which demands satisfaction for the egoism of the individual, for the self-assertive tendency even in the act of giving, and resents in a quite literal sense as a personal injury, a slight upon his self-importance, any hint of deprivation. In one or two cases where possessiveness took on more definitely the character of a miserly hoarding the child resorted to various shifts and concealments to preserve his belongings from meddling intruders.

Almost as common in its occurrence amongst these children as possessiveness is the trait of orderliness as regards their personal belongings. They cannot bear to have their toys, books and small possessions moved from the place where they have been used to keep them, and they must be ordered and arranged just as their owner would have them and not otherwise. Again the remarks of the parents during the course of the interview are illuminating. One girl (Case No. 77) is described in these terms:

"She is so strongly possessive that no one dare touch /

touch anything that belongs to her. She is very orderly about her belongings - 'like an old wife at times with her things'.

And again from Case No. 50:

"He fusses about his belongings and keeps his toys arranged in the corner allotted to him in a box which he shares with the other children in the family 'as dainty as a woman's dresser'. He scolds the youngest child, for whom he shows in other directions a very marked affection, if she meddles with them".

Manifestations of stubbornness and extreme self-willedness are less frequently remarked upon, but they are amongst the most commonly noted traits, and appear in a number of the cases in a very pronounced form. By reason of them the stutterer is able sometimes especially in those cases where compensatory aggression also is at work, "to fill the house", if we may borrow an apt description from Miss Coster, "both physically and spiritually to such an extent that his brothers and sisters are almost crowded out of existence". It is of interest and may not be without significance to consider in this connection the stutterer's position in the family not merely as regards order of birth but in relation to the other children actually present in the household. In 43 of the homes concerned in the present investigation there were four children or more, in 14 there were three, in 9 there were two and in 12 the stutterer was the only child. The cases were distributed as follows:

Only /

Only child	12
First child (of two)	5
First child (more than two)	10
Second child (of two)	4
Second child (more than two)	11
Youngest child (more than two)	17
Other positions	<u>19</u>
Total	78
	==

Five of the 16 "youngest children" ought properly on account of the difference in age between them and the next older member of the family and the general attitude towards them of the rest of the household to be considered as only children. It is noteworthy that 29, or more than one-third of the group as a whole, belong to one or other of those classes and tend to reveal in greater or less degree the indulgence or over-stimulation of which the youngest or only child is apt to be the victim. Our figures entirely fail to confirm Appelt's unsupported assertion, put forward in the interests of his Adlerian conception of the disorder, that the stutterer is in the great majority of cases, the second child.

Stubbornness, recalcitrance, and unwilling obedience appear most clearly amongst our cases in the youngest or only children, and in conjunction with strong compensatory aggressive tendencies in some of the second children (vide Case No. 2).

The stutterer, as we have seen, does not avoid social /

social contacts. Nor does he make a special effort to evade situations in which speech will be required of him. Amongst his own contemporaries and at home the stuttering child is both talkative and noisy, as the testimony of the parents indicates in the great majority of cases. Under the conditions of examination at the Clinic, except in the most disabling cases of the impediment they were frequently distinctly conversible, and revealed a command of vocabulary and expression in spite of the disorder which gave the lie to expectation. It has been observed that the adult stutterer is prone to over-valuation of language and speech, and it is in keeping with this observation that a few of our cases merited the imputation, if not of glibness, at least of verbalism.

III. THE PRESENT INVESTIGATION.

Experimental Methods and Results.

In the part of the present research which is now to be discussed an attempt has been made to repeat under different conditions and in some cases with different experimental methods some of the experiments which have from time to time been reported by Travis and those who have set about elucidation of the problems of stuttering under his direction in the Psychological and Speech Clinic of the University of Iowa. Whether or not those experiments will bear the heavy superstructure of theory and clinical practice which Travis has erected upon their results, the findings are of sufficient general importance to demand attention and verification.

1. A comparative study of voluntary control of the mechanism of speech in stutterers and normal speakers.

Opposed views of the differentiating and causative factors in the disorder of stuttering have been proposed by Fletcher and Travis. Both are agreed that the essential characteristic of the disturbance is to be found in the failure of the synerg~~ic~~ic functioning of the three musculatures of speech which consist of the mechanisms /

mechanisms of breathing, phonation, and articulation. Apart from minor differences in emphasis and detail, they agree also as to the manifestations of that disturbance of function in so far as these are apparent during stuttering speech itself. They differ fundamentally, however, in their interpretation of these symptoms and in their exposition of the background upon which they are to be understood. According to Fletcher, the disorder of stuttering takes its rise in and is maintained by psychological factors which become effective only in connection with the willed act of speech, and then only when speech is used for purposes of communication. If any one of the elements in that activity be altered, all trace of the disturbance should disappear. Allow the stutterer to read in unison or alone, and his utterance will be as free as that of the normal speaker. Similarly, ex hypothesi, if he is asked to control the movements of respiration, or of the mechanism of articulation in isolation, and for any purpose other than that of communication, he should find it no more difficult to do so than the normal subject. Fletcher has maintained that the ordinary (involuntary) breathing of the stutterer shows no significant difference from that of the subject who has no disorder of speech. Briefly, it is the essence /

essence of his theory that stuttering arises only in and is conditioned by certain relational situations as a pathological social response so that in any situation in which stuttering can be eliminated all the more profound manifestations of the speech-disorder will also disappear. Travis, on the other hand, admits the importance of these mental and emotional factors only as accessories, and for the most part, accessories after the fact which are not significant for the fundamental explanation of stuttering. "In the great majority of cases the basic cause of stuttering is to be sought in some significant variation in the functional integration of the central nervous system, and not in so-called 'mental complexes' and emotional maladjustments". Now, if the failure of co-ordination which is apparent in stuttering speech is a symptom of such a basal disorder of physiological function as Travis imagines, and is not aroused by the temporary social context of the individual, then it is reasonable to suppose that the disturbance will be apparent in the functioning of the mechanism of speech even when speech itself is not required. Gutzmann and his disciples in Berlin, following out an older line of theory, have maintained that the breathing of the stuttering subject does reveal significant abnormalities even in situations where speech is not /

not demanded, in the form of spasms or of an inability to retard expiration to the same extent as the normal speaker. But subsequent observations by Fröschels, and even the results obtained by Gutzmann himself suggest that these phenomena cannot be regarded as reliable differentiae of stuttering. Blackburn, working under Travis, has studied the voluntary movements of the diaphragm, and of the lips, jaws, and tongue in stuttering and non-stuttering subjects. In all four activities he found that the stutterers manifested defective control by comparison with his normal subjects, even although speech was eliminated from the experiments, and the social factor was reduced to a minimum. The experiments which are now to be described duplicate the work of Blackburn in this field.

The purpose of these experiments was the same as that of Blackburn's, namely, to compare stuttering and normal subjects in respect of control of separate parts of the mechanism of speech during voluntary activity from which speech was specifically excluded. Voluntary movements of the musculature of respiration, and of the lips and lower jaw only were recorded by means of a clockwork kymograph running at a constant speed. The time was recorded by a common electrical marker-magnet.

Two belt pneumographs (Figure VII) of the type employed /

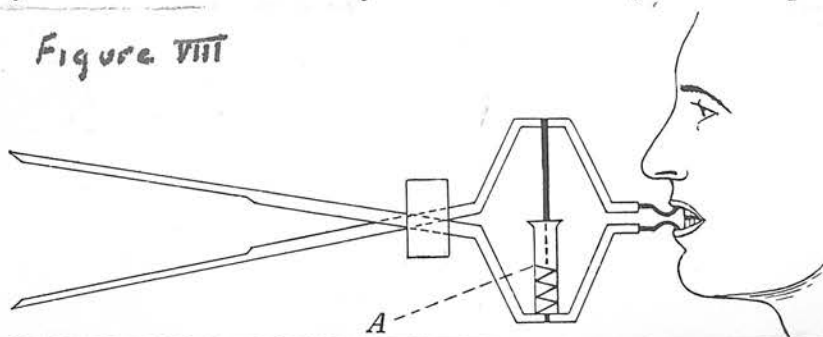
employed by Gutzmann were used for recording the breathing movements. These pneumographs are constructed, as shown in the accompanying diagram, on a base formed by a stout rubber belt, to the inner side of which a strip of finer rubber is attached to form in connection with the recording tambour the usual closed air system.



FIGURE VII.

In recording the movements of the lips and jaws Blackburn employed two simple rubber bulbs with walls of different thicknesses, and giving a single tracing on the kymograph for each performance. Apart from the inconvenience and difficulty in manipulating these, his account of the experiments records no precautions of any kind taken to prevent movements of the lower jaw during the movements of the lips. The apparatus used for registering the movements of both the lips and jaws (Figure VIII) in these experiments was a modification of the lip-recording apparatus described by Gutzmann, in which the two recording styluses are directly controlled by the lips.

Figure VIII



Since the apparatus acts like a pair of scissors the movements of the lower lip are registered by the upper stylus, and vice versa. For the movements of the lower jaw only one stylus is required so that, the lower arm of the apparatus being fixed, the upper half of the mouthpiece forms a fulcrum or point d'appui for the upper teeth. Between the arms of the apparatus a small rod and cylinder (A in the accompanying diagram), in which a spring is inserted, were introduced in place of Gutzmann's pneumatic bulb. The spring employed in the apparatus for recording the movements of the jaw was considerably stronger and more resistant than that of the lip apparatus.

During the actual experiments the subject was seated before the apparatus with eyes closed in order to prevent his attempting to regulate his performance by watching his own record. The subject was required, during the recording of the lip-movements, to hold firmly between his teeth a small piece of rubber or linen in order to eliminate possible movements of the lower jaw. The precaution was a necessary one, as the unpractised subject whose natural control of the lips is inefficient tends invariably to resort to biting and chewing. In the breathing experiments movements of both the thorax and the abdomen were recorded by separate pneumographs and /

and tambours, the subject being seated with his back to the recording apparatus. In all cases the procedure of the experiment was fully explained and the nature of the performance demonstrated by the experimenter, emphasis being laid, as in Blackburn's investigation, upon the requirement of rhythm or regularity in speed of movement. Three periods of practice of fifteen seconds each were allowed for each subject for each of the three types of performance. Apart from the instruction that movements were to be "fairly rapid" the subjects were left to set their own speed.

On account of individual differences in fatiguability, Blackburn stipulated no uniform period of performance, or of rest-pauses, instructing his subjects to rest during any experiment whenever they felt that fatigue was interfering with the regularity of performance. In our experiments, where most of the subjects were children, it seemed better to set a definite time-limit of performance even if the interval had to be very short. After some preliminary trials with subjects who were not included in the experiments proper, a period of fifteen seconds, followed by a rest-pause of approximately forty-five seconds, was set as the uniform limit of the interval of work. The actual records and the reports of the subjects themselves /

themselves indicate that no significant degree of fatigue was induced in that time by any one of the performances. The voluntary movements of the lower jaw, which were for all subjects the easiest of the three tasks, could indeed have been carried on for much longer without trouble. Ten such records, amounting in all to 150 seconds of actual performance, were taken for every subject on each test. At most six records were taken for any one of the tests on any one day.

In these experiments twelve stutterers and twelve normal speakers were the subjects, three adults and one girl being included in each group. Nine of the subjects in each group were children between the ages of eleven and fifteen years, and so far as might be, an approximate equivalence in chronological age was preserved between the opposite members of the two groups. One of the stuttering subjects failed to complete the full series of experiments; his records have been disregarded in the discussion which follows.

Regarding the handling of the data Blackburn writes: "Since the aim of all trials was to discover the ability of the Os in performing voluntary rhythmical movements of certain peripheral speech organs, the chief quantitative variable to be recognised was the regularity of /

of performance". In order to obtain the required measure of variability he counted the number of movements in every fourth second, finding therefrom the standard deviation in the number of movements performed from second to second. To render the measures comparable for the different types of performance, Pearson's co-efficient of variation, $V = \frac{100 \text{ S.D.}}{\text{Average}}$, was calculated for each subject. We have here followed Blackburn exactly with the exception that, as the total amount of work done was less than in his experiments, the movements have been counted for every third second. Although a double breathing record was taken the upper chest movements have been disregarded, and only the movements of the diaphragm considered. Similarly the movements of the lower lip only have been counted, movements of the upper lip being for several of the subjects quite negligible. The statistical results are shown separately for the stutterers in Table X, and for the normal subjects in Table XI.

TABLE X. (over).

	1	2	3	4	5	6	7	8	9	10	11	12
A. <u>Breathing.</u>	M.	5.06	5.26	5.54	7.38	8.10	6.46	6.44	4.82	-	5.68	7.28
	S.D.	1.06	0.66	1.94	1.67	0.79	1.50	1.03	0.61	-	0.89	1.70
	V	21.01	12.53	35.00	22.63	9.74	23.18	15.99	12.76	-	15.63	23.35
B. <u>Jaws.</u>	M.	6.39	6.72	5.93	7.56	7.02	4.24	5.04	5.54	-	5.67	5.40
	S.D.	0.56	0.98	0.86	0.92	1.04	0.61	0.71	0.36	-	0.67	0.81
	V	8.71	14.61	14.41	12.19	14.82	14.45	14.03	6.53	-	11.86	15.07
C. <u>Lips.</u>	M.	7.93	7.05	6.02	6.52	8.10	5.73	5.78	5.47	-	5.82	6.16
	S.D.	0.83	0.78	0.98	0.89	1.33	0.72	0.69	0.58	-	1.41	1.36
	V	10.50	11.08	16.25	13.65	16.39	12.58	11.91	10.54	-	24.18	22.14

TABLE X.

Results from experiments on voluntary control of speech mechanism.

(a) stuttering subjects.

M. - Average movements per second.

	1	2	3	4	5	6	7	8	9	10	11	12
<u>A. Breathing.</u>												
M.	6.82	7.57	5.76	5.49	6.66	7.30	5.41	3.96	5.24	7.20	3.96	6.71
S.D.	0.51	0.44	0.55	0.56	0.53	0.32	0.54	0.13	0.60	0.48	0.22	0.73
V	7.48	5.86	9.58	10.18	7.91	4.38	9.94	3.35	11.53	6.70	5.58	10.83
<u>B. Jaws.</u>												
M.	9.30	8.06	4.17	6.22	4.34	5.45	7.00	2.41	4.13	3.81	4.47	5.19
S.D.	0.63	0.65	0.17	0.47	1.55	0.76	1.13	0.45	0.63	0.45	0.33	0.28
V	6.74	8.01	4.02	7.61	14.43	13.97	16.11	18.71	15.22	11.92	7.47	5.33
<u>C. Lips.</u>												
M.	8.74	7.19	5.07	6.04	4.30	6.96	6.06	1.79	5.68	5.77	6.09	6.47
S.D.	0.76	0.59	0.89	0.57	0.80	0.78	0.55	0.45	0.74	0.53	0.52	0.57
V	8.68	8.19	17.61	9.50	18.64	11.22	9.00	24.87	13.05	9.21	8.60	8.88

TABLE XI.

Results from experiments on voluntary control of speech-mechanism.

(b) non-stuttering subjects.

M. - Average movements per second.

Even superficially considered, the comparative indications of the two tables appear to provide point to point confirmation of Blackburn's findings. More closely scrutinised, the results afford an even clearer and more unequivocal demonstration of some of his conclusions, than his own data, where he was prevented by gaps in his tabulated results from making any assessment of the significance of the differences which they indicated, and in particular from emphasising or attempting to estimate the importance of the divergence in the results from the different tests. In summary form, the statistics from our two groups are as follows:

	Stutterers (Mean V).	Normals (Mean V).	Difference.
A. Breathing -	20.4	7.9	12.5 \pm 1.5
B. Jaws -	12.9	10.7	2.2 \pm 1.1
C. Lips -	15.6	12.7	2.9 \pm 1.3

In all three types of performance the stutterers tend to show a higher degree of variability than do the normal speakers. As in Blackburn's experiments also, the difference in favour of the latter is far more marked in the voluntary movements of the diaphragm than in either of the other performances, in both of which the differences between the two groups is not considerable. In control /

control of the rhythmical movements of respiration under the conditions of the experiment the difference between the stutterers and the normal subject is statistically significant to the extent of being nearly eight times as large as its probable error. In the results of the experiments on the movements of the lips and jaws the groups differ only by about 2 P.E.

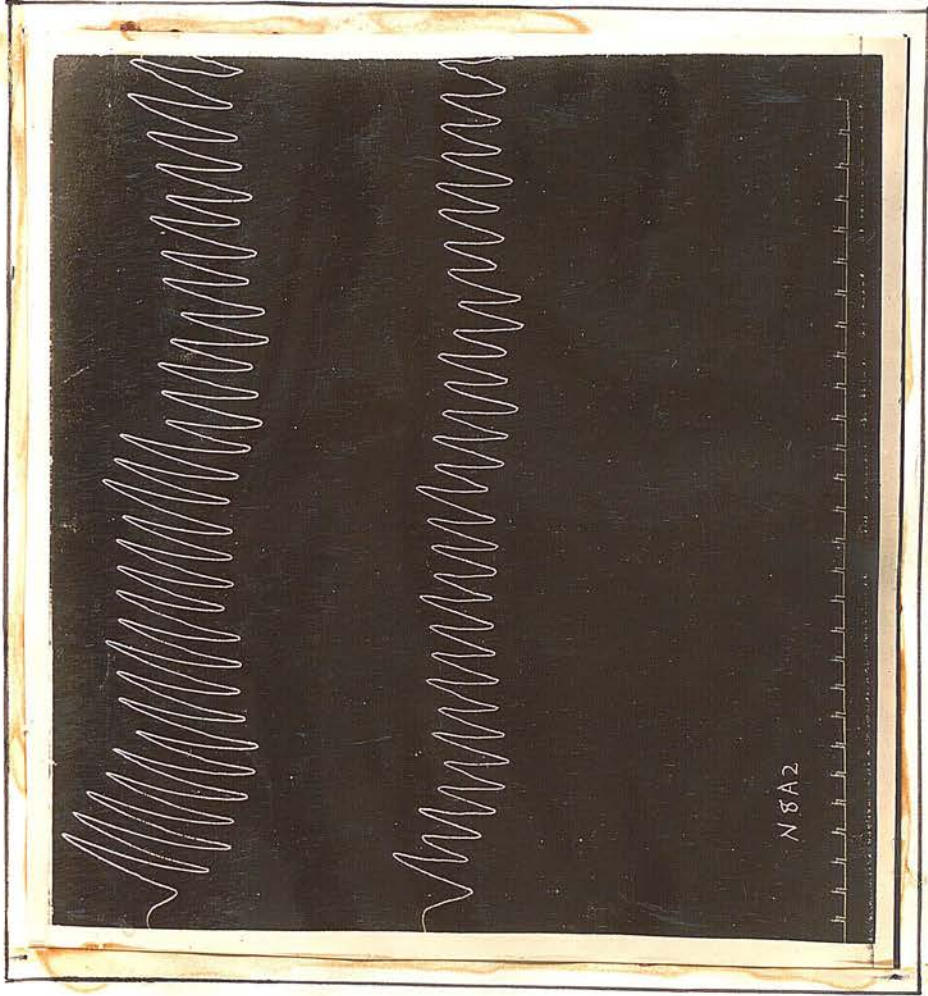
It is in line with these quantitative results that our records should for the most part fail to show, except in the experiments on breathing, anything approaching the gross distortions, blockings, haphazard retardations and accelerations, and extreme moment to moment fluctuations in amplitude which seemed in Blackburn's experiments to be indicative of striking qualitative differences in performance. In so far as these occurred in the movements of the lips and jaws, they were probably as much the result of difficulty in manipulating the rubber bulbs which he employed as of real differences in the performance of the subjects. In the records obtained in the present experiments, except for those of breathing, the only superficial distinguishing features of most of the tracings were of the nature of what we might call "signature differences". At an early stage in the different tests the subjects tended to standardise not only /

only the speed, but also the characteristic form of the movements, so that the tracings of one subject were as distinct from those of the others as a sample of his handwriting would have been, and in part at least as a result of the same underlying temperamental factors which are responsible for the differences in script. These idiosyncracies of performance were most clearly distinguishable in the movements of the lips and were no less characteristic of the normal subjects than they were of the stutterers. The grosser variations in the breathing records of the stuttering subjects are not sufficiently constant for the different individuals to warrant any attempt to classify them into distinct types.

These results, therefore, offer emphatic corroboration of the conclusion that stutterers show a marked inferiority to normal speakers in voluntary control of the mechanism of respiration even when they are not required to utter a word. In control of the rhythmical movements of the lips and jaws they show a similar but much less pronounced deficiency. If, as the results indicate, the differences in the latter performances are to be regarded as insignificant then the experiments serve only to narrow the problem to the explanation of the specific inferiority in voluntary control of respiration. Even if /

if it might be argued in criticism of the results of the experiments that the ascertained abnormality of function might well be the outcome and expression of a psychological reaction - anxiety or fear - to the experimental situation itself, the result still stands as an objection to the theory of Fletcher that stuttering or the morbid traits of personality of which it is the symptom are related not to the social situation as such, but to the social situation in which speech is demanded.

Some typical records are reproduced which serve to illustrate the foregoing discussion. In every case the time is recorded in half-seconds. In the breathing records the lower curve represents the movements of the diaphragm, the higher one the movements of the musculature of the upper chest. In the records of the lip-movements the tracing from the upper lip always appears below that of the lower. The first plate is a record of the breathing of the most regular of all the normal subjects, characterised by well-nigh perfect rhythm and perfect synchronisation of the two tracings. Following it are two similar records by stuttering subjects. The first of these (Plate II) is distinguished by the large wave which supervenes in the movements of the upper chest, independent of the rhythm of the voluntary panting and bearing no relation /



Plak I

Voluntary panting (normal).

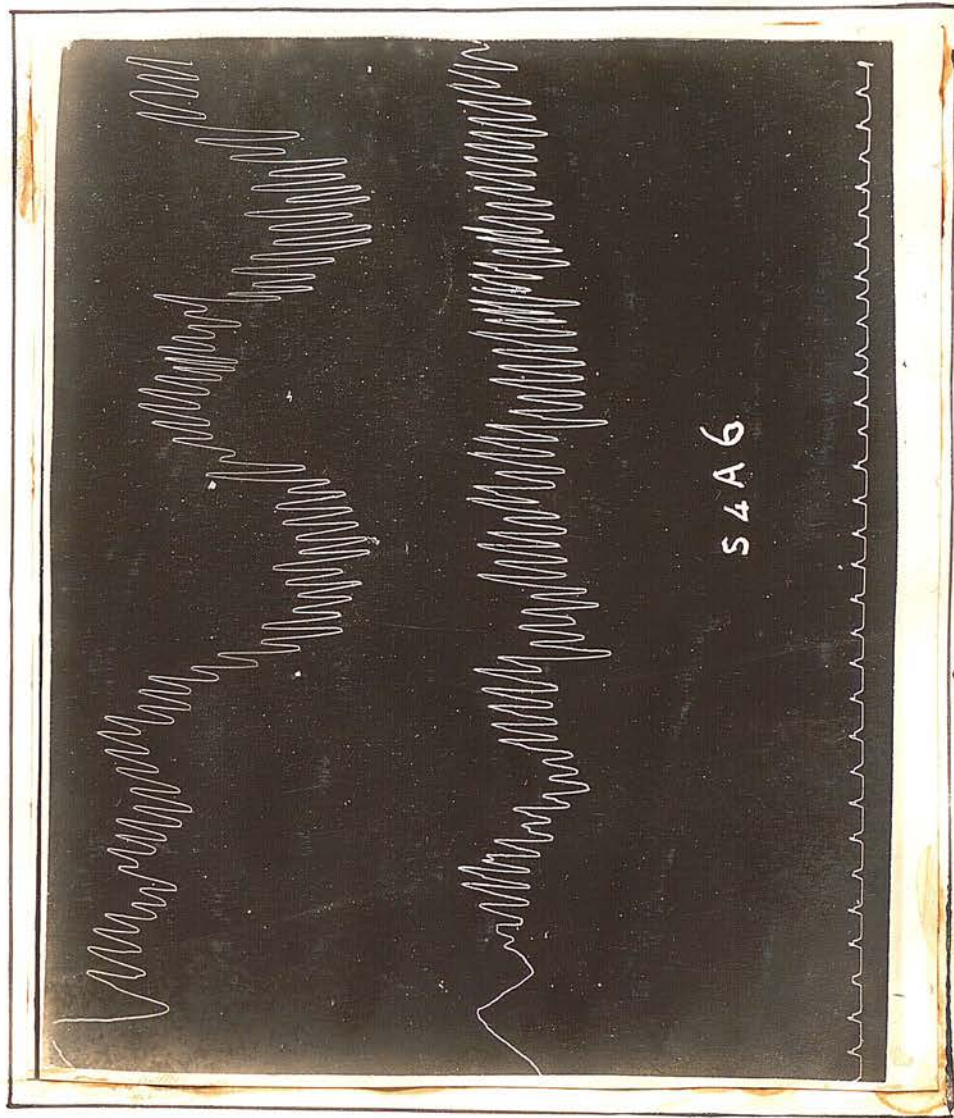


Plate II

Voluntary panting (stuttering subject)

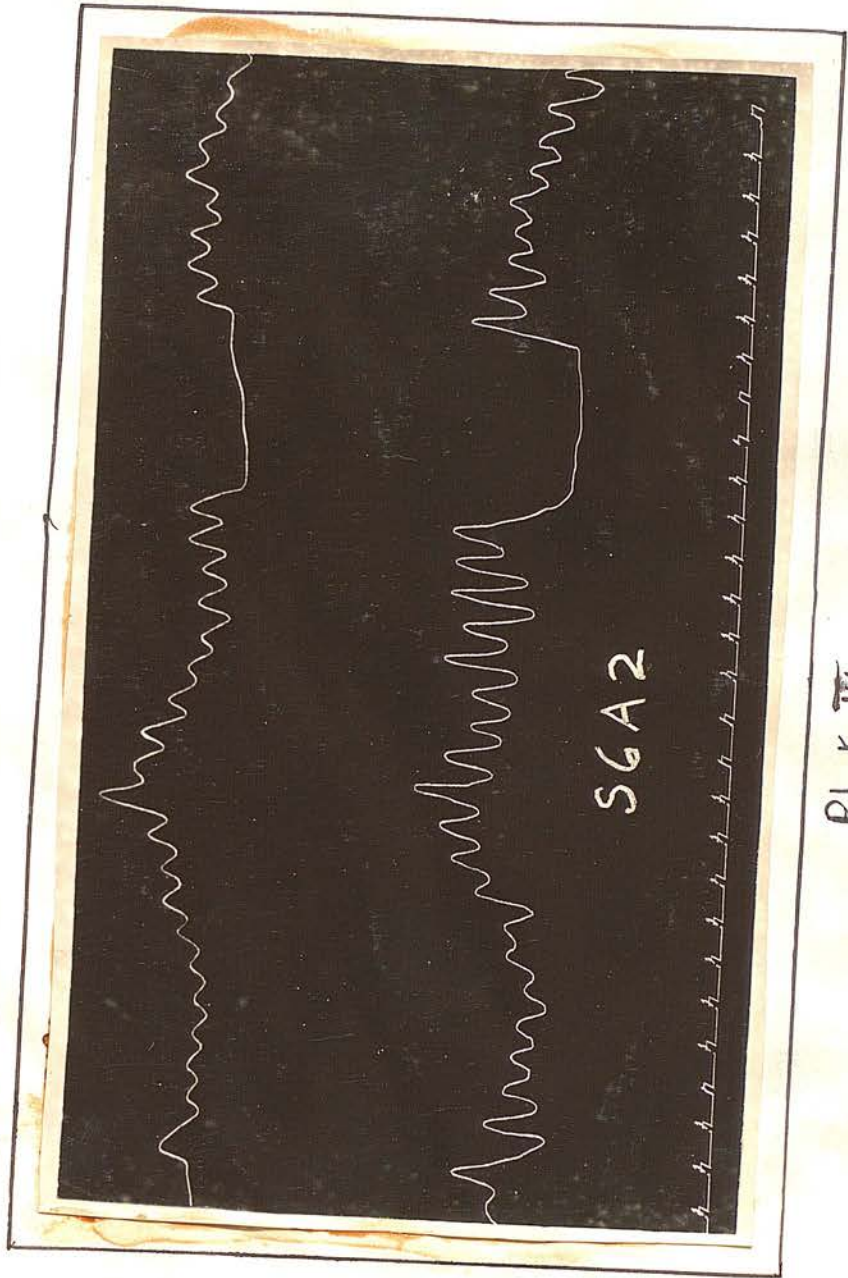


Plate III

Voluntary panting (stuttering subject).

Plate IV Fig. 1
Voluntary Lip-Movements
(Stuttering subject).

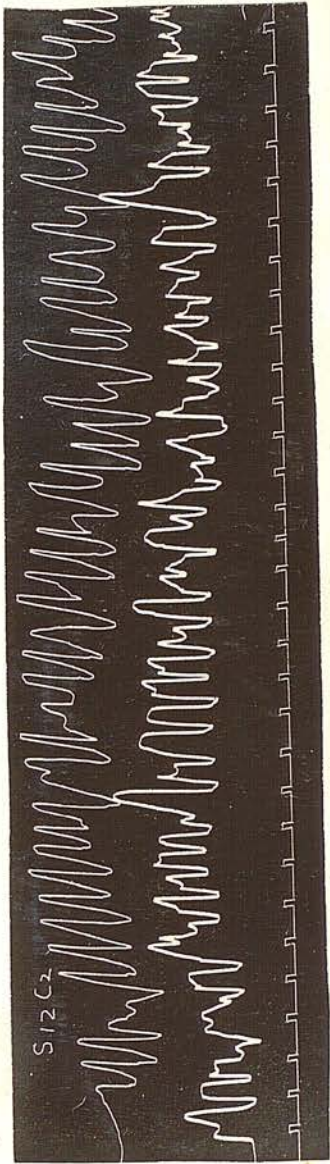


Plate IV Fig. 2
Voluntary Lip-Movements
(Normal Speaker).

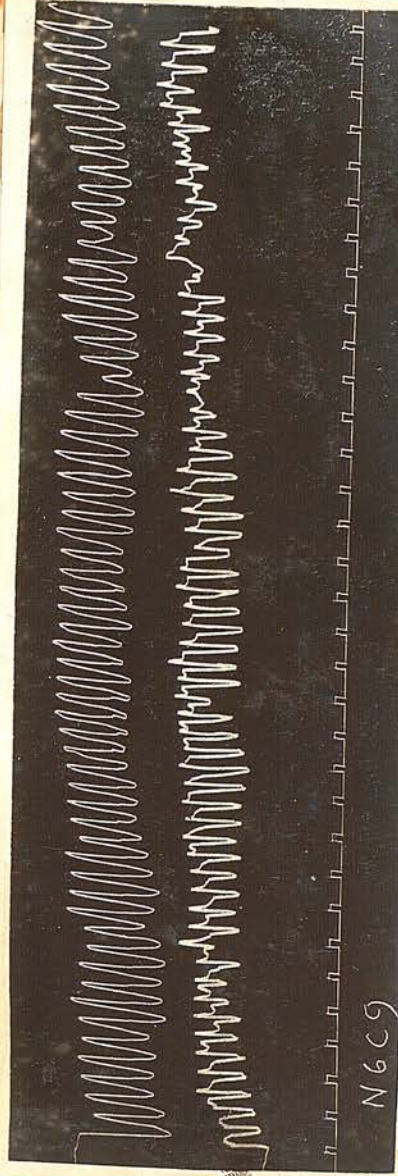


Plate V

Fig. 1
Voluntary Jaw Movements.
(Stuttering Subject).

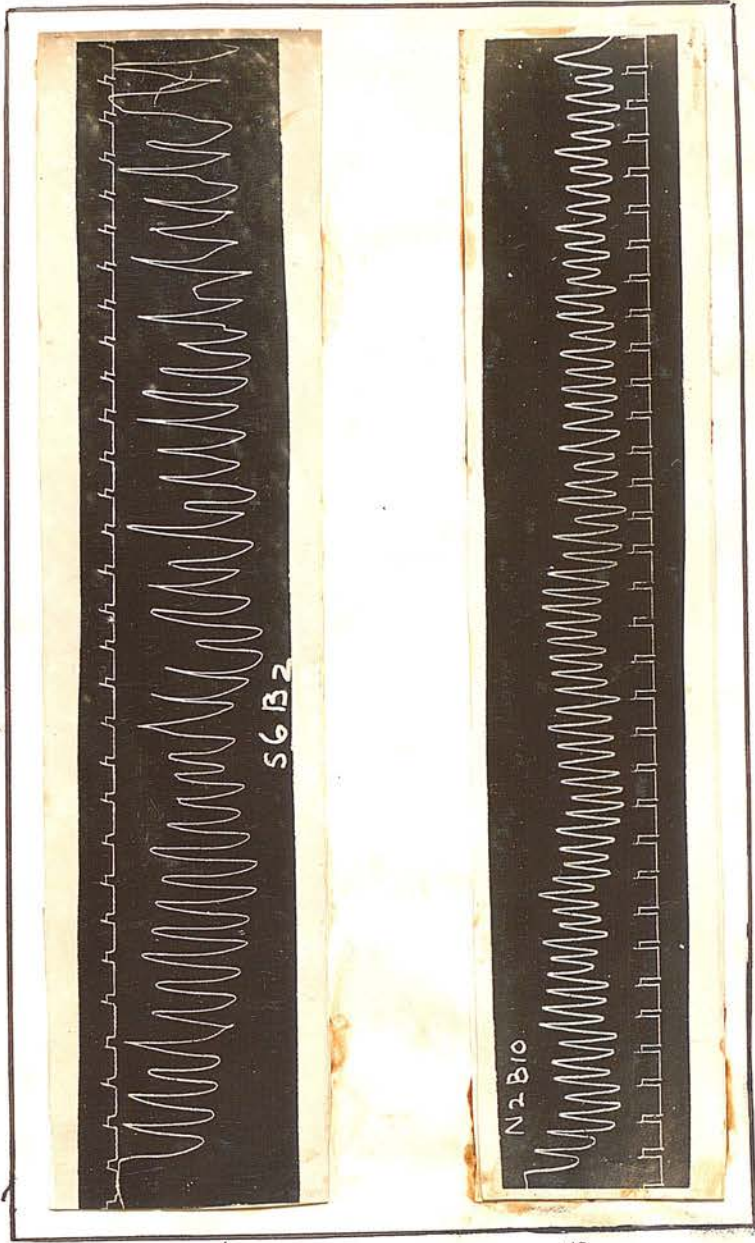


Fig. 2
Voluntary Jaw Movements
(Normal Speaker).

relation to the abdominal movements recorded below.

The second record by a stutterer (Plate III) is interesting because it exhibits very clearly, like several other tracings by the same subject, the occurrence of a hysterical manifestation, which had only recently become one of the most prominent features of this girl's attempts to speak. At a point rather more than half-way through the record there appears a complete temporary block during which for two full seconds no respiratory movement whatever occurs. According to the report of the girl herself, the stoppage was accompanied by the same distressing sensation of choking which from time to time seemed to check her utterance altogether. Plate IV Figure 1 is a characteristic record of the lip-movements of one of the more irregular of the stuttering subjects in this type of performance. At no point in the tracing is there any indication that control has been established or constancy of speed attained. The amplitude of the movements varies quite irregularly and the opening or closure of the lips is interrupted or momentarily reversed and then continued to the complete destruction of the rhythm. This record may be contrasted with the corresponding one (Plate IV Figure 2) by a normal subject, which is distinguished by its regularity, both in the speed and extent of the movements, and by the well-defined /

well-defined form of the recurrent movements, especially of the upper lip. (i).

2. Stuttering and Manual Preference.

In spite of the commonly expressed opinion and the widespread belief that stuttering is in some way related to left-handedness, the connection - if there be a connection - between the two is far from clear and reliable authorities are by no means agreed even upon the facts at issue. Even if the results of investigations which have appeared to indicate a relation between speech and handedness could be accepted as valid and reliable, the problem of interpretation which they raise cannot be settled out of /

- (i) Blackburn conducted as a check upon the performance of the speech mechanism a simple tapping test, both right and left hands being tested. In this experiment he found no significant difference in variability between stutterers and normal speakers. His published table of results, however, indicates a marked difference which appears to have escaped the notice of the experimenter and of Travis, in the light of whose theory it might have a real meaning. The mean standard deviations for the performance of the two hands show that in the case of the right-handed normal subjects the standard deviation of the performance with the right hand was only half that of the left. With the right-handed stuttering subjects the values are not only reversed but the standard deviation for the right hand is more than six times that of the left-hand performance. The result is suggestive in connection with Travis's theory of the anomalies of bilateral functioning which are supposed to be characteristic of the stuttering subject.

of hand. It is not certain even whether the explanation must be in psychological or physiological terms. The general assumption now is that the disorder of speech is not connected with left-handedness as such, but that it is liable to be aroused when there is interference with the manual preference of the individual. Most frequently, therefore, it will arise in those cases which have suffered an enforced change from left to right-handedness under the compulsion of environmental requirements. It is not a valid criticism of the assertion to emphasise, as Fletcher does, the fact that in many so-called dextre-sinistral stutterers the speech-disorder has been established before the child came to school. Although the teacher may be the sole or the most important agent in compelling the left-handed child to employ his unaccustomed and unwilling right hand, and although the writing act - partly because of its close connection from the outset with language, and partly because of the blood and tears which may be spent in acquiring current script - may be of special significance in relation to the language function, other influential factors have to be considered. Even where the left-handed individual never becomes right-handed, the efforts of well-intentioned adults are usually directed to that end during his early years, although they may be compelled to give up the hopeless task in despair, /

despair, and the whole force of the child's ordinary environment, above all the implements he learns to handle, work in the same way. In such a case, and even in the complete absence of external compulsion the actual differentiation from the other individuals in his environment, may give rise by way of reaction or compensation, to unwanted psychological developments. It is reasonable to suppose that stuttering might supervene as one form of expression of such deeper disturbance, and observation appears to confirm the assumption, at least in the case of children of an unstable, emotional or neurotic type.

The evidence upon which the assertion of a connection between left-handedness and stuttering has commonly been founded has been derived from two sources: on the one hand, large-scale investigation, generally by questionnaire, supplemented in some instances by individual examination of some of the cases; on the other, observation in clinical practice or elsewhere, of particular cases in which the speech-disorder is known to have resulted after or to have appeared concomitantly with an externally imposed change of handedness. Ballard has reported two extensive surveys of the English school population from the results of which he concluded that there is some connection between handedness and the motor mechanism of speech, so that disturbance of the former gives rise to disturbance of the latter. In the earlier investigation /

investigation conducted by questionnaire alone, he ascertained the proportions of stutterers as follows: of the dextrals, 1.2 per cent; of the pure sinistrals 1.1 per cent; of the dextro-sinistrals, or congenitally (sic) left-handed children who had learned to write with the right, 4.3 per cent. Stuttering, therefore, appeared to be about four times as common amongst the dextro-sinistrals as among the rest of the children. In a subsequent research he carried out a personal examination of the left-handed cases after these had been previously ascertained by questionnaire. Of approximately 12,000 children, 2.2 per cent were dextro-sinistrals in terms of Ballard's definition. At the time of the examination 17 per cent of this group stuttered, and 25.8 per cent were known to have stuttered at some time in the past.

Wallin, in a study of the children in the public schools of St. Louis found that 9.4 per cent of the children who had been forced to change from left- to right-handedness showed defects of speech. His statistics, as reported by Fletcher in The Problem of Stuttering, do not make clear how many of these children were stutterers, although his results for the general school population show that the stuttering children constituted only about a quarter of the total number of speech-defectives. /

defectives. 9.5 per cent of all the stutterers found were dextro-sinistrals, and 8.6 of all the children showing other speech-defects also fell within this group. Fletcher has made the correspondence between these two proportions a ground of criticism of the opinion that there is a connection between stuttering and handedness. But it is not inconceivable that in this regard some at least of the other defects of speech may be conditioned in the same way as stuttering itself. Lipping, for example, does arise in some cases as a neurotic manifestation and appears intermittently and under conditions similar to those which in another individual would give rise to stuttering. Wallin is himself disposed to doubt, however, whether any significance can be attached to the higher percentage of speech-disturbance amongst dextro-sinistrals, in face of the obvious fact that the vast majority of the ^{dextro-sinistral} children in the St. Louis schools had not developed any speech-defect.

The highest figures recorded for the concomitant incidence of stuttering and interference with the manual preference of the subject are those given by Travis. Of several hundred stutterers examined over a period of three years at the Iowa Speech Clinic 43 per cent are said to have been originally left-handed. He cites also a study by Bryngelson in which out of two hundred cases /

cases subjected to intensive study 62 per cent were left-handed individuals who had been required to change to the right hand for most of the principal manual activities, including writing.

A considerable number of well-authenticated individual cases have been from time to time reported where the speech-disorder was found in association with the absence of any definite preference for either hand, or in which it was known to have appeared after a change of handedness. Not the least significant of these have been studied by investigators whose testimony is the more valuable in so far as they were not primarily concerned with the speech-disorder, and were in consequence wedded to no particular theory. Such a case has been reported by Fildes and Myers, in an account of a series of experiments on a markedly left-handed boy, between six and seven years of age. Having just begun to write with the right hand, he came under observation because of his pronounced preference for the reversed or mirror form of the letters and numbers. At the same time he began to stutter. For this reason, and because he had great difficulty in writing with the right hand, he was allowed to write with the ~~right~~ left hand only. The confusions in the positions of the letters and the disturbance of speech thereupon disappeared together. The case is typical /

typical of those that have been reported. No cases showing this dramatic sequence have been observed in the present research. Deliberate control investigations in which the effect of training right-handed children in the use of the left could be tested are in the nature of the case practically impossible. But one such experiment has been carried out by Lewis (referred to by Oates). In a period of five months during which an attempt was made to train twelve right-handed subnormal children in the use of the left hand all of the subjects developed stuttering. The speech-disorder cleared up when the training was discontinued. The result is a valuable one, though its significance is perhaps diminished somewhat by the fact that the subjects of the experiment were all below the normal level in intelligence. It is in keeping, however, with the observations by Sachs of several cases in which stuttering appeared after the right hand or arm had been incapacitated by war-injuries. It should be remembered, however, that in cases of this kind the shift in manual skill was certainly not the only factor at work to produce the speech-disorder, although there is reason to believe that it may have been the central one.

Impartial consideration of the large number of experimental /

experimental results and clinical cases which fall into line with those that have been cited here must bring us at least to acknowledge that in the relation between handedness and speech we are confronted with a real problem. There is reason also to believe that the problem has deeper and wider implications than our present knowledge enables us clearly to appreciate. Apart altogether from their significance for our understanding of stuttering, the facts of handedness in themselves demand experimental study and theoretical elucidation.

3. Incidence of left-handedness in the
stuttering cases studied in the present
investigation.

Number of cases	78
" " left-handers	8
" " dextro-sinistrals	8

In the course of the clinical studies reported in an earlier section of the present record, careful enquiry was made in each case to ascertain whether at any time the child's handedness had been subjected to interference, either of set purpose, by parents or teachers, or as a result of post-natal accident. In addition an attempt was made to arrive at a more accurate estimate of the number of true left-handers by means of a few simple tests: winding a ball of string, throwing a ball, cutting with scissors, and folding a sheet of paper. None of /

of these has any unusual merit or scientific reliability, but many children who write with their right hands reveal their natural left-handedness in these simple operations. Dynamometer records were also taken, but these have been discarded as being quite worthless for diagnosis in the individual case. The tests did not reveal more than one case which was not known as a result of the history obtained from the parent or guardian to be or to have been left-handed. But the figures thus ascertained are striking. Of our 78 cases, 10 per cent were declared left-handers, who wrote left-handedly in school, while the same number were admitted to have shown an inclination to use the left hand rather than the right at an earlier stage which had been checked with a greater or less degree of rigour. In some the left-handed propensity had been almost completely suppressed. In most of them, however, it manifested itself in a mixed performance even on our simple tests, and in two of them at least (vide Cases 66 and 72) the uncertainty had persisted and become extended over the whole range of the child's manual activity. Both of these children, the one aged $7\frac{1}{2}$ and the other almost 14, could write with either hand but by preference reverted to the left in using ordinary implements and utensils. But, however interesting the problems of these individual cases may be, the central point /

point at issue is thrown into even bolder relief by the fact that in the group taken as a whole one-fifth of the children were properly left-handed. In every one of these cases some attempt, whether successful or not, had been made to train the child to conformity with the right-handed majority.

4. The Problem of Laterality.

The problem of unimanual preference and of the preponderance of right-handedness in the ordinary population has not been newly recognised. Sir Thomas Browne in his Pseudodoxia Epidemica asserted that handedness is "the result of institution and not of nature". But it has only recently been realised that the problems of handedness must be restated in terms of laterality of function in general. The basis of the connection between handedness and disorder of speech must ultimately be found in the relation between this laterality of function and "dextrality", to use Dr. James Kerr's term for "the one-sided specialised aptitude or capacity associated with the psychical phenomena of speech so marked in the left brain".

Even if the oldest Londoner and Pithecanthropus were both left-handed, as Professor Elliot Smith has proved, everything goes to show that the tendency towards /

towards right-handedness became established at a very early stage in human history. None of the ad hoc explanations of its racial origin or of its development in the individual can be regarded as satisfactory. To conceive of it like Sir Thomas Browne or J.B. Watson as the result of "institution", of social training and imitation, and not of inborn predisposition lands us in an infinite regress. Different explanations have been proposed by the theorists who consider handedness as a congenital trait. Attempts have been made to connect handedness with the asymmetrical structural features of the body, such as that which is apparent in the unequal distribution of the viscera, with its consequent displacement of the centre of gravity. The supposition is not supported by the fact that in those cases of transposition of the viscera where the handedness has been recorded it has generally been right. Some evidence exists that the left cerebral hemisphere is more highly organised than the right, and Gratiolet long ago attributed right-handedness to the early stages of foetal development in which the anterior and middle lobes of the brain are in a more advanced condition than those on the right. At an early stage also observations were brought forward which suggested that cerebral physiological asymmetry was the result of the differential blood-supply to the two hemispheres. /

hemispheres. But later experiment has not confirmed the assertion of a significant difference in calibre between the right and left carotid arteries within the skull.

Obviously any theory which traces the preference for one or other hand to the prior unilateral dominance of some other factor, whether ocular or cerebral, pushes the attempt at explanation further back. When this happens, it becomes increasingly impossible not only to consider the facts of dextrality and sinistrality in isolation from the wider aspects of "sidedness", which find expression elsewhere as in "footedness", and "eyedness", but also to consider the problem at the human level alone. There are indications of asymmetrical development and function in organisms much lower in the biological scale which present a similar bilateral structure, and recent studies have suggested that such structural bilaterality must be regarded as a particular form of twinning. In the twinning relation one twin usually gains a physiological ascendancy over the other, so that it is conceivable that unilaterality of function might arise similarly in man. Whether or not the goal of the biological process is the development of a bilaterally symmetrical individual, we /

we should anticipate in practice all degrees of asymmetry between the two halves of the body.

From a physiological standpoint the problem as it presents itself in connection with the disorders of speech is complicated by uncertainty regarding the answer to the question whether the asymmetrical control of speech by the brain must necessarily correspond with that which exists for the strictly one-sided motor activities of the individual. Dr. James Kerr considers that dextrality or the one-sided control of speech is genetically a separate quality from left-handedness, the latter being transmitted as a Mendelian recessive, which may be sex-linked in some families. Records of aphasic cases certainly suggest that the number of persons in whom the right hemisphere plays any significant part in the control of speech is very small. But exceptional "crossed aphasias" are reported in which in an apparently right-handed person, left-sided cerebral lesion has failed to produce disorder of speech, or in which the opposite condition of disturbance of speech as a result of right-sided injury has arisen. But even if the control of speech and the central factor underlying motor preference may be localised in different hemispheres in the same individual, this would indicate only that external interference /

interference with that organisation or specialisation of function is unlikely to have any effect on speech if it becomes influential after the organisation has been fully and definitely established. The development of a defined preference for one side or the other in the principal motor activities seems on the face of it to present a particularly clear case for interpretation in terms of Stern's "convergence theory". It cannot be regarded as a mere maturation of an inborn trait or as the result only of external influence. It is rather the outcome of the convergence or interaction of both the given potentialities and external conditions. Every observer knows that the young child displays no preference for either hand, and that in the individual case its appearance may be indefinitely delayed. If external influence is brought to bear in opposition to an innate tendency which has not certainly declared itself, or before the central organisation has been established, it is at least conceivable that disturbance of the unilateral control of other functions, such as speech, might result. A case of this kind would then be only a particular instance of the general possibility of arrest in the development of the trait in question. In some individuals such arrest might be /

be the effect of endogenous causes alone without the contributory influence of such exogenous factors. Such persons might display a lack of definite preference for either hand, or foot, or eye, or else belong to one of the crossed types, whose eye-preference, for example, is not in agreement with their handedness or "footedness". Support for this line of thought can be found in the greatly increased proportions amongst mental defective both of speech-defects and stuttering, and of left-handedness, so-called but in many of these cases probably more truly uncertain handedness.

At this point, however, a further consideration arises which helps to confuse rather than to clarify the issue, namely, the relative efficiency of the two hands of the same person or of different individuals in the same manual operations. Presumably, in the individual who shows a marked preference for either hand - not to beg the question as to the existence of "pure" types of handedness - predilection and skill will agree. But is skill conditional upon predilection, in the sense of a pronounced innate tendency to use one hand rather than the other? Or, what is more important, is the absence of a relatively high degree of skill in either hand the result of, or at least invariably accompanied by a lack of such predilection? Is the seemingly left-handed child, who is not so much dexterous /

dexterous with the left hand, as gauche with both left and right, as Burt has suggested, "an evident case for right-handed training" ? Both Burt and Kerr assume that very inefficient performance with both hands is an index of absence of innate preference for either. But apart from the general tendency in the normally efficient person for the skilled hand to be also the preferred hand, we have no exact evidence regarding the relation between preference and such degree of skill as there is in cases which vary from the norm. The same problem arises at the opposite end of the scale of manual ability where we find the small group of individuals who are equally or almost equally skilful with both hands. Some, perhaps most, of these persons have only become ambidextrous by dint of strenuous and consistent effort years after unimanual skill has been fully developed. It is not certain whether in many of these cases, where ambidexterity may have been acquired, for example, for professional reasons the new-found ability of the ordinarily auxiliary hand becomes really general or remains specific to the operations in which it has been practised. Even when it is generalised, as in the case of Sir Victor Horsley, who could change his stylographic pen in the middle of a sentence and go on writing with the other hand, the individual retains /

retains in practice and for all ordinary skills, his original preference. Is this preference, which we have seen reason to consider as innately conditioned, in the normal right- or left-hander to be entirely differently explained in these cases as the result of training and habituation? If all degrees of asymmetry of structure and function exist, this may very well have happened. But attention may be called to one consideration, and one practical conclusion may be drawn. However slight the original preference in these cases early training seems to have fallen into line with it, the ambidextrous skill being later acquired after it and the speech function were fully established. Secondly if an innate tendency to preference of one hand or the other can be proved to exist, and if satisfactory tests can be devised in order to estimate its direction, it would be reasonable in cases of uncertainty or delay in its expression to attempt differential education only after they have been applied.

After this digression, we return to our main problem of the relation between stuttering and anomalies of handedness or laterality. Clearly, however commonly they may be associated, the concomitance between /

between "dextro-sinistrality" and disordered speech is by no means absolute. The assumption of the present supporters of the theory is that speech and manual skill are alike controlled by a single dominant hemisphere, and that stuttering will arise under any condition which tends seriously to disturb this relation of dominance and subordination between the two halves of the brain, or in which such a relation is not satisfactorily established. Apart altogether from external interference such a state of things will be established if the innate predisposition towards the dominance of one or other hemisphere is weak. These correspond to Kerr's group of cases of "poor dextrality". It is supposed also that unilateral dominance may be diminished or its development arrested by external interference with its natural expression. In the former event definite evidence of the subject's "central laterality", or "native physiological lead", to use Travis's terms for the assumed innate tendency, may be difficult to obtain. His preference for either hand or foot or eye may be quite indefinite. In the latter, certain experimental techniques will reveal the central predisposition or preference, which, as a result of frustration, has failed to manifest itself in /

in the subject's expressed "handedness". As a result of his studies in stuttering, Travis has presented a mass of experimental data in which he finds evidence of anomalies in the "handedness", or if the more inclusive term be preferred, the "sidedness" of the stutterer. His emphasis has been laid, however, and his clinical practice guided chiefly by his interpretation of the results of his investigation of the performances of stutterers and normal speakers in the four tests of

- A. Unilateral sighting.
- B. Simultaneous writing.
- C. Motor leads in abduction-adduction movements of the hands.
- and D. Mirror Drawing.

The third of these is disregarded here. The implications of the others will be discussed in connection with my own findings as a result of applying the experiments to a group of stuttering subjects and a control group of normal speakers.

5. Experiments on the Bilateral Neuro-muscular Organisation of Stutterers and Normal Speakers.

The subjects in these experiments consisted of a group of 24 right-handed stutterers and 25 right-handed normal speakers. In each group there were three adults and three girls. The control subjects were /

were selected so that the two groups were approximately matched in equivalent pairs for intelligence and age. The description of the subjects as right-handed is based simply upon their known general preference and not upon the results of any tests previously applied as a means of selection. All of them were subjected, however, to a preliminary empirically devised test of handedness, intended less to provide any reliable information as to their manual preference than to be a simple check upon their development of this trait. This test consisted of ten simple tasks, some single-handed, and *some* in which both hands were used, as follows:

- (1) Using a duster.
- (2) Clasping the hands, the dominant thumb being noted.
- (3) Distant reaching, for a watch medially placed on the table before the subject.
- (4) Winding a toy watch which could be turned equally easily in either direction.
- (5) Threading a needle.
- (6) Combing the hair.
- (7) Dealing cards.
- (8) Throwing a ball.
- (9) Sweeping with a long-handed broom.
- (10) Hopping, the only test not strictly of "handedness".

On the results of these tests the normal speakers showed on the average 86 per cent of preference for the right hand as against 14 per cent for the left; the stutterers 82.5 per cent of preference for the right /

right hand as against 17.5 per cent for the left. Scrutiny of the individual results reveals, however, that only four (or 16 per cent) of the normals made a score of 100 per cent for right-handedness as against 7 (or 29 per cent) of the stutterers. The complete record of the scores for the two groups is as follows:

<u>Per cent</u> <u>Right-</u> <u>handedness.</u>	<u>No.</u> <u>Normals.</u>	<u>%</u> <u>Normals.</u>	<u>No.</u> <u>Stutterers.</u>	<u>%</u> <u>Stutterers.</u>
100	4	16	7	29.1
90	11	44	4	16.7
80	7	28	5	20.8
70	2	8	4	16.7
60	1	4	4	16.7

The results even of this simple and relatively crude test serve to point to the fact that the terms right and left-handedness cover a considerable range of individual differences even in this so commonly supposed all-or-nothing trait. Of our forty-nine subjects only eleven or just over 20 per cent were right-handed on all of the tests. No one of them had been deliberately changed from left to right-handedness at any time, nor had any of them been subjected to training in ambidexterity but five fall just above the half-way line with six of the ten tests right-handedly executed. It is not without interest, although its significance cannot /

cannot be stressed that four of these last should have been members of the stuttering group.

(a) Unilateral Sighting.

The object of the tests now to be considered in the observation of the eye preference of the subject when he is required to look through a device which restricts him to monocular vision without his being aware of the fact that he is sighting with one eye only. A modified form of Parson's manoscope, originally devised for this purpose, was employed in the experiments. As described by Parson and in the form employed here, it consists simply of "a small darkened box or camera-like chamber, one end of which fits over the eyes and the upper part of the face after the manner of a stereoscope, from whence it tapers for nine inches to a circular aperture $1\frac{1}{8}$ inches in diameter at the farther end."

Parson introduced the conception of unilateral sighting in order to explain the phenomena of handedness and in opposition to the "double eye" or "Cyclopean eye" theory of binocular vision. The view to which Parson objects, as expressed by C.S. Myers, is that "under ordinary circumstances we localise binocularly seen objects in a direction midway between the two eyes, and in unocular vision our localisation rests /

rests usually on this basis". He argues that it is possible to deduce from the writings of Herring and Helmholtz that they both possessed true or impartial binocular vision and were misled thereby into the belief that the conception of the imaginary median eye provided a satisfactory explanation of our normal perception of a single object in binocular vision. In so far as such equality of the two eyes is very rare, it is true that the "Cyclopean" eye shifts from its ideal median position towards that of the preferred or stronger eye. This shift is accompanied by a corresponding displacement in the localisation of seen objects, and by various modifications in the phenomena of homonymous and heteronymous doublings. In consideration of these facts, Parson maintained that the majority of persons are as certainly right- or left-eyed as they are right- or left-handed. Not content with this, however, he went on to insist that in the matter of manual preference eyedness is cause and handedness effect, that we are right-handed because we are right-eyed. The manoscope was therefore invented as and asserted to be an infallible test of "native handedness", since, apart from cases of acquired sensory defect, the eyedness will remain the same even if the handedness is changed. /

changed. But such a claim cannot be established. In his own early experiments Parson obtained the following results from manoscopic tests of 877 children:

<u>R-eyed.</u>	<u>L-eyed.</u>	<u>Impartial.</u>
608	257	12
69.3%	29.3%	1.37%

Of the 608 right-eyed cases only 4 were left-handed. Two of these were aware of eye-trouble sufficient to explain the discrepancy; Parson argues but does not prove that the other two must at some time have had similar ocular trouble or have found it necessary to change their handedness because of injury to the right arm. Of the 257 left-eyed, only 32 were left-handed, a result which Parson explains as due to right-handed training. If this were to be accepted, congenital left-handedness must be enormously more frequent than the figures for observed sinistrality would suggest. Although it is certain under the conditions of our right-handed civilisation that there must be more real than declared left-handers, it is to be doubted whether the difference would be as great as the divergence between Parson's figure of 29 per cent for the former and the commonly quoted figure of 4 to 8 per cent would imply. But the correspondence between handedness and eyedness although marked is far from exact, and whether or /

or not the proportions of right- and left-handedness are the same amongst persons born blind as amongst the sighted it has never been suggested that they show any abnormal degree of natural ambidexterity.

Although eyedness cannot, therefore, be regarded as the cause of handedness, it has been accepted by Travis as another and less equivocal indication of the natural "sidedness" of the individual. The assumption is that, since in each eye the macula is connected with both hemispheres, the same relations of dominance and subordination hold good for normal vision that are postulated for speech. He has made use of the manoscope in order to determine the "native handedness" of his stuttering subjects. The indications of the researches which have been published uniformly tend to show a preponderance in the groups of right-handed stutterers examined of left-eyed or amphiocular individuals. Amongst 55 right-handed normal speaking subjects he found that 73 per cent were right-eyed, whereas of 48 stutterers only 50 per cent were right-eyed. As the result of a further survey he states that 60 per cent of 301 right-handed stutterers were left-eyed or amphiocular. Jasper, in an investigation conducted under Travis's direction, obtained with groups of subjects /

subjects selected on the basis of a careful questionnaire study of handedness as extreme representatives of their respective types similar proportions which indicated that, as regards eyedness the stutterers should be classified either with the left-handed or the ambidextrous normal speakers.

In the present investigation the procedure was as simple as possible. The subject stood facing the examiner and about ten feet away from him. He was then instructed to raise the manoscope, look directly at the examiner, and then lower it again. Three trials were given for each subject, with the proviso that in cases where the right eye was preferred on only one of the three trials, two additional trials should be given. If the subject showed a preference for either eye on two out of three or three out of five trials that eye was recorded as dominant. The result of these experiments is shown in Table XII.

	<u>Right.</u>	<u>Left.</u>	<u>No. of cases.</u>
Stutterers.	46	54	24
Normals.	64	36	25

TABLE XII.

Comparison of right-handed stutterers and right-handed normal speakers in respect of ocular preference.

The results agree no better than those of other investigators /

investigators with Parson's claim that the manoscope is an infallible test of native handedness. Despite the small number of cases the percentages show the same general indications as those of the American investigators in the larger number of preferences for the left eye amongst the stuttering subjects. The co-efficient of association between stuttering and left-eyedness as ascertained in this way, offers some statistical check upon the facts. In our experiments, it is $0.2 \pm .05$, a figure which although statistically significant, is probably too low to have much real meaning.

(b) Simultaneous writing.

Most children during the early stages in learning to write now and then produce inverted or mirror-script in which odd letters are reversed, usually those which are perfect or approximate mirror-images of one another such as b and d, and g or q and p. These "nursery reversals" - Dr. Kerr's happy term for these specific manifestations which are probably to be distinguished from the appearance of the phenomenon as a persistent anomaly - indicate that lateral orientation is only gradually developed. Kerr considers that this development takes place pari passu with that of the function that he has called dextrality, or, in terms of /

of Travis's theory, of the more or less complete dominance of one or other cerebral hemisphere. In normal children these anomalies rapidly disappear with the stabilisation of the child's script and of his perceptual apprehension of the distinguishing features of the letters and figures. Amongst mental defectives and apparently also, in certain psychopathic types, the peculiarity is of much commoner occurrence and far more stubbornly persistent.

None of the explanations of mirror-writing that have been proposed is completely satisfactory. Reversals occur most frequently in the writing of left-handed children, which is in accordance with the consideration that mirror-writing is the normal sinistral expression. But after the initial difficulties have been overcome of acquiring a script devised by and in accordance with the convenience of a right-handed majority, there is no apparent reason, as Gordon has pointed out, why the pure or natural left-hander should continue to mirror-write. Commonly in these reversals, the successive movements are correctly executed in relation to one another. This fact has suggested the commonly accepted explanation that the anomalies are the result of independent functioning of the visual and motor /

cues in writing. The contention is supported by the results of Kerr's experiments in testing English school-children in copying English and Russian words. In these reversals occurred only of letter-forms common to both alphabets and with which the children therefore had some previous acquaintance. But it seems obvious that in some cases at least mirror-writing may be the result of incorrect perception, or of "mirror-reading". The mere existence of the latter peculiarity is damaging to the theory that mirror-script is produced in the absence of or under conditions that prevent the appearance of a clear visual image so that the child is compelled to fall back upon his motor memory. Further, mirror-writing by right-handed beginners would be more adequately explained by supposing it to be the correct reproduction of an incorrect visual image.

The facts of the persistence of mirror-writing in some cases of speech-defect and its appearance in the writing of some persons when one hand is employed while writing is correctly carried out by the other raise further difficulties. Lionardo da Vinci may have been during his later years a victim of hemiplegia, but the mere fact that he was thereby forced to write with /

with his left hand does not account for the complete reversal of the handwriting in his manuscripts. Condemned by writer's cramp for a time to the use of his left hand, Sir James Barrie did not present his printers with any such problem in cryptography. Kerr is of the opinion that the normal child, when tested in writing with the left hand, should be able to do so, however badly, correctly oriented. He goes on to say: "Whenever this correction has not been spontaneously attained, during ordinary school-life, strong suspicion of subnormal mentality is aroused. In the case of children with speech-defects persistence of mirror-script on attempting writing with the left hand justifies a very guarded prognosis as to hopes of improvement". The sequence of statements here carries a dangerous and dubious implication. As the outcome of his tests of mirror-writing amongst the left-handed children in Special (M.D.) schools, R.G. Gordon puts forward an explanatory hypothesis which is significant in connection with our present problem. Mirror-writing is closely associated with mental deficiency and with left-handedness. But it is not explained by either because, on the one hand, only 8 per cent of the mentally defective children wrote mirror-wise, and on the /

the other, very few left-handed children of normal intelligence showed reversals. The fact of the concomitant mental deficiency and left-handedness suggests to Gordon that "the same cause may in some cases have brought about left-handedness and mirror-writing, that in fact something may have affected the dominant (in these cases the left) hemisphere. It may have been a lesion, causing among other things a slight hemiplegia, or it may have been due to defective development of the dominant hemisphere". In such cases the left-handedness would be different from ordinary "natural" left-handedness. He considers that this would explain the abnormal prevalence of left-handedness amongst mental defectives. Interference with the left hemisphere has interfered with the proper function of the right hand, perhaps in only a slight degree, as many among the older children change spontaneously from the left to the right hand in writing. If this were so, the same cause might also have affected the functioning of many of the higher intellectual centres, supposed to be situated in the same hemisphere, so that mirror-writing and speech-defects have been developed.

The resemblance between Gordon's supposition and the "dominance" theory of stuttering is very clear. Logically, if stuttering is the expression of the impaired /

impaired control of the naturally predominant hemisphere or of competition between the two halves of the brain, the anomalous condition should present unequivocal manifestations in the relative performances of the two hands in similar operations. According to Travis and his co-workers, experimental evidence is readily obtainable for this belief. In the symmetrical organisation of the neuro-muscular system the movement of the right hand in a clockwise direction is analogous to a movement of the left in an anti-clockwise direction. If the right-handed orientation is preserved when both hands write simultaneously then the direction of the movement must be determined by the dominant half of the organism. Evidence of competition, or at least of failure of the normal relation of dominance and subordination between the two halves will be found in the breakdown of this similar orientation. In a study of 283 stutterers Travis found that 70 per cent of them produced mirror-script with either or both hands when they were required to write the same letters simultaneously. Reports of subsequent experiments from the Iowa Clinic confirm this finding.

In the present investigation the test has been employed with the experimental group of 24 stutterers and /

and 25 normal subjects. The procedure followed was that described by Travis. The subject was required to write a dictated series of digits and letters in ordinary current script on the blackboard as quickly as possible with both hands at once and with the eyes closed. In this part of the experiment the following series of four digits and six letters was given as fast as the subject could write them: 2, 7, 3, 9, g, d, y, h, e, p. The number of characters to be written on the blackboard in Travis's investigations had been twenty. This number was made up in the present study by an additional series of three digits and seven letters which were written in a similar fashion but in pencil as follows: 6, 4, 5, c, q, m, k, s, b, r. Reversals were recorded separately for the two hands, there being four possible combinations of writing in this test:

- (1) right orientation with both hands (RR).
- (2) mirrored orientation with both hands (MM).
- (3) right orientation with the right hand and mirrored orientation with the left (MR).
- and (4) right orientation with the left hand and mirrored orientation with the right (RM).

A single subject may show all four orientations in the course of the test. The results of the test are shown /

shown in Table XIII and Table XIV. The former gives the percentage recurrence of each of the anomalies in each of the groups, and the latter the number and per cent of individuals in each group showing the various combinations of writing.

	RR	MR	RM	MM	Total % anomalous.
Normals.	85.8	12.6	1	0.6	14.2
Stutterers.	75.2	19.8	4.8	0.2	24.8

TABLE XIII.

Results of test of simultaneous writing.

(a) Percentage occurrence of anomalies.

	Normals.		Stutterers.	
	N	Per cent.	N	Per cent.
RR	13	52	9	37.5
MR	1	4	0	0
RM	0	0	0	0
MM	0	0	0	0
RR MM	1	4	0	0
RR MR	8	32	12	50.0
RR RM	0	0	1	4.2
MR MM	0	0	0	0
RM MM	0	0	0	0
RM MR	0	0	0	0
RR RM MR	2	8	1	4.2
RR MR MM	0	0	0	0
MM MR RM	0	0	1	4.2
RR RM MR MM	0	0	0	0

TABLE XIV.

Results of test of simultaneous writing.

(b) Number of subjects showing anomalies.

Amongst the normal subjects 12 (or 48 per cent) showed reversals of one kind or another under these conditions, one subject mirror-writing every one of the twenty characters. Of the stutterers 15 (or almost 63 per cent) showed reversals. The actual number of reversals of each kind also shows an increase in the latter group. As in all the experiments of this kind, the most frequently found type of reversal for all subjects was the mirrored orientation with the left hand. Taking the crude presence or absence of reversals to indicate failure or success on the test, we find amongst the normals 13 (or 52 per cent) showing perfect scores, the right orientation being preserved with both hands throughout. Of the stutterers, 9 (or 37.5 per cent) were similarly successful. These numbers give an coefficient of association between the tendency to stutter and the tendency to produce reversals under these conditions of $.2 \pm .05$.

Whatever degree of emphasis we may lay upon the results of this test, their interpretation is by no means obvious. A greater number of our normal subjects showed some tendency, however slight, to produce reversals under the conditions of the experiment, than that which has generally been obtained by Travis and others. /

others. But the corresponding figure for the stutterers is not unlike those which have been previously recorded. Their higher percentage of anomalies cannot be considered quite simply as an indication of a suppressed tendency to left-handedness. But it does differentiate them from right-handed normal speakers in such a way as to suggest that in his motor expression and in the neuromuscular organisation underlying it the stutterer is less definitely one-sided, and more the battle-ground of conflicting powers than they are.

The manifestations of these peculiarities are not confined to the experimental situation. Observers have noticed the persistence under ordinary conditions in some stutterers, who could not be regarded as unintelligent, of a tendency to mirror-reading and mirror-writing. No specific attempt has been made to follow up this lead in the present research, but occasional mirror-reading has been observed in one or two of the older subjects, and a significant note is added by the class teacher to her report on Case No. 12. She says in response to a request on the prepared record sheet for any additional relevant information: "He is inclined to form his letters and figures backwards; otherwise he is neat in his writing, drawing, and hand work". The relevant facts regarding the case are as follows:

Chron Age 10 3/12 (9 months above class average)

Intelligence. Herring Revision of Binet Scale. M.A. 9.6. I.Q. 94.

Educational Tests. Reading: Burt's Graded Vocabulary, 10.0. Spelling: Burt's Continuous Graded Test, 11.8. English: Burt's Northumberland, 10.7.

Physical examination. Circulatory system: Heart action shows Sinus arhythmia. Nervous system: Pupils moderately dilated; knee-jerks exaggerated; skin damp.

Psychological examination: Stuttering appeared soon after the boy went to school. Nervousness and excitement about the school-situation are said to have been induced by his first teacher who continually drew adverse comparisons between the boy and a very clever cousin who had previously been in her class. He is described by his mother as timid, nervous and babyish.

The most prominent features of his attempts at speech were the disturbance of breathing and the clonic movements of the lower jaw before and during utterance. When he succeeded in speaking his voice was very hoarse.

Tests of "handedness". Writes R. Never changed from L. Dynamometer (best of three) R, 18; L, 20. Manuscope, R. Six of the ten tests described above performed left-handedly. Simultaneous writing, RR 0; MR 10%; RM 85%; MM 5%.

Treatment. The boy is at present under observation and treatment in the ordinary group of stutterers where relaxation, rhythmic movement, and rhythmic speech form the main elements in the attack.

This boy was recommended for treatment with some misgiving. The above record shows very clearly the phenomena upon which Travis would base an attack upon the /

the speech-disturbance by developing the child's left-hand activities and suppressing the right. Although there is no history of a change of handedness the results of nearly all the tests are strongly indicative of a left-handed tendency. Mirror-script is produced with one or other hand on every one of the twenty characters written, and in seventeen out of the twenty with the right hand. The only test which fails to give an indication of left-handedness is that of eyedness. A satisfactory record of the boy's progress under the present treatment is not yet available.

(c) Mirror-drawing as a test of handedness.

The common mirror-drawing test was first used as a test of "native handedness" by Travis in his experiments on the neuromuscular organisation in stutterers, and on the basis of his results he has seen fit to employ it for clinical diagnosis in cases of speech-disorder. But there is reason to believe that its theoretical foundations as such a test are far from sound, and that the indications of "handedness" or "central laterality" which it gives will not bear the superficial interpretation that he puts upon them. Travis argued in the report of his first study of right-handed normal speakers and right-handed stutterers that the /

the mirror-drawing situation seems especially adaptable to the determination of the basic superiority of the right or the left hand since it confronts the subject "with a relatively new task in which the two hands are on an approximately equal basis". In his experiments Travis used the ordinary line-star, instructing his subjects to trace its outline as rapidly and as accurately as possible in the direction indicated. Only the time taken for the complete tracing was taken into account in the measurements. His main general conclusions are based on the results of the first two trials of his subjects, the first with the left hand, the second with the right. Under such conditions he finds that the great majority of his right-handed stutters tend to record a better time on the first trial with the left hand than on the second with the right. With right-handed normal speakers this result is reversed. No left-handed subjects were included in Travis's studies so that it seemed possible to accept the result as an indication that the stutterer's deep-seated physiological bias is in disagreement with his expressed dexterity.

In the present investigation the only change in the technique of the experiment from that employed by Travis was in accordance with the suggestion of Jasper regarding /

regarding the kind of star used in the tracing. With the single line star the time taken to complete the tracing cannot be considered an adequate measure of the efficiency of performance in view of the number and extent of the deviations from the line. In the hope that the errors would be reduced, or at least rendered manageable in scoring the results, a star was substituted in which the outline was formed by small circles 2 mm. in diameter. The instructions were the same as those given by Travis except that the subject was told to try to touch each of the circles on the way round. It was intended that the form of the star should give the subject some idea of the standard of accuracy required and increase the actual accuracy of performance. Neither expectation was fulfilled in our experiments. The results of the experiments are presented in Table XV which shows the average times for each group, in the order of the four trials given, left, right, right, left. Table XVI indicates the relation between the performances of the two hands on the different trials.

TABLE XV. (Over).

Trials.

	L1		R1		R2		L2	
	Average.	S.D.	Average.	S.D.	Average.	S.D.	Average.	S.D.
Normals.	202 ± 18	133	210 ± 12	89	126 ± 8	63	86 ± 9	69
Stutterers.	246 ± 20	146	283 ± 22	160	167 ± 11	80	104 ± 8	57

TABLE XV.

Average times (in seconds) in mirror-drawing experiment for stutterers and normal speakers.

The differences in Table XV and their co-efficients of significance are as follows:-

Table XVI

Normals:	(a)	between L1 and R1	8	(P.E. diff.	21.5).
	(b)	" R2 " L2	40	("	12.7).
Stutterers:	(a)	" L1 " R1	37	("	29.7).
	(b)	" R2 " L2	63	("	13.5).
Normals and Stutterers:	(a)	" L1 " L1	44	("	26.8).
	(b)	" R1 " R1	73	("	25.0).
	(c)	" R2 " R2	41	("	13.9).
	(d)	" L2 " L2	18	("	12.3).

Few of these differences are significant even to the extent of being three times as large as their probable errors. The difference on the first two trials of the normal subjects is negligible, and even in the stuttering group, where it appears in favour of the left hand, it is barely 1.5 times its probable error. Both groups show the expected marked improvement between the last two trials where the stutterers show a fully significant difference and the normals one which is fully three times its probable error. The largest differences between the groups are those on the right hand trials. Whereas the right-handed normal subjects simply start at scratch in the second trial, several of the stutterers become very much worse in this first trial /

trial with the right hand so that the groups become much more widely separated. In the absence of a left-handed group it is difficult to put any very definite interpretation upon these results, although the general direction of the differences is in keeping with those of Travis's published results. The number of individuals in each group who were more efficient on the first trial with the left hand than on the second with the right seems to emphasise the differentiation of the right-handed stutterer from the right-handed normal subject. On our tests 14 (or 56 per cent) of the normal subjects and 17 (or 71 per cent) of the stutters recorded a lower time on the first trial than on the second.

But in spite of precautions the results seem to be of dubious validity. Even with the new form of star, the deviations in the tracing are many and frequently gross. No satisfactory way is apparent of combining time and deviations in order to arrive at a more valid assessment of performance. The pronounced qualitative differences between the records of different subjects precludes any method based simply upon counting the deviations, even if that were possible. Secondly, until we know more about the test itself and the performances of subjects of different types and degrees /

degrees of handedness we cannot go far in interpretation of the results. A priori, it is the right-handed subject who should experience greater difficulty with the right hand in mirror-drawing, since the test reverses the habitual cues to co-ordination of hand and eye. Such experimental evidence as there is confirms on the whole this supposition. The properly left-handed subject should similarly find less difficulty in this type of performance with his right hand. If, therefore, the differentiation of the stutterers from the right-handed normal subjects is significant, it does not seem to be in the direction of left-handedness. The present results offer no sure ground for any speculation as to the basis of the difference. Jasper has argued that the experiment may present to the ambidextrous subject or to the subject with no definite dominance of either side, a different problem from that which it presents to the individual who is more definitely right- or left-handed. He would have us assume that in the former the "native handedness", such basal dominance as does exist, will manifest itself in greater facility in motor activities of the dominant side. But it is difficult to accept this interpretation. Whatever the "native handedness" or the /

the "central laterality" of the stutterer may be, if he is by training right-handed, he must have built up the same eye-hand co-ordination cues as the normal right-hander, which will in both cases suffer the same interference under the conditions of the experiment. The results obtained with this test amongst right-handed normal and right-handed stuttering subjects consistently show that about half of the former, and about three out of four of the latter are more successful with the left hand than with the right when the trials are taken in the order left-right. The theoretical basis of the experiment and of this result require analysis and elucidation.

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Part IV

The Clinical material : being the records of the 78 cases upon which the foregoing study of the problem of stuttering is based.

Abbreviations :

- P. or G. Parent or Guardian.
B. Brothers
S. Sisters.
W. Age of walking
T. Age of talking
F. Illnesses.
Q. Qualifying examination : whether passed.

1.

Case 1

Age. 9 yrs. 3 mths.

P. or G. Both alive; mother well; father, see below.

B. One, aged 3.

S. One, aged 8.

Class Sen. 1 (Miss Brown)

Q. No.

W. 18 months.

T. About 15 months.

I. Measles (slight); chicken-pox; takes cold readily; adenoids and tonsils about three years.

PROBLEM. STUTTERING.

Information supplied by mother :

FAMILY HISTORY. Mrs. - , who brought John to the Clinic, says that she herself is sensitive and highly strung. Mr. - is at present at Bangour Village, Bangour, where he has been for the last three years as the result of a nervous breakdown. Before he went to Bangour, life with him became very difficult. He expressed delusional suspicions of his wife's infidelity. He was allowed to come home for three weeks, but had to be readmitted and there appears to be no improvement at present in his condition. Mr. - was wounded during the War and after he came home had a long period of unemployment. Before the War there was nothing to suggest the probability of the later developments.

John has lived for the last three years with his grandfather and grandmother. There are no other children in the house. His own brother and sister live with the mother. There is no evidence of left-handedness in any other members of the family, either on the father's or the mother's side. Mrs. - knows of no members of the family who have stuttered or suffered from any other speech disorder.

Two other children have died, the eldest and one younger than John.

PERSONAL HISTORY. John's birth was difficult and premature by one month. According to his mother, he was not expected to live. She herself was in good health at the time.

He/

He was a very small baby, about 4 lbs. in weight at birth. He was bottle-fed from the beginning and was weaned at 12 months, rather suddenly. Mrs. - does not think that any special difficulties arose over weaning. He refused a comforter when it was offered to him. There is no evidence of prolonged thumb-sucking or of nail-biting. He was circumcised at the age of about three months, because of urinary difficulties. There has been no serious subsequent enuresis. He was easily trained in habits of cleanliness.

John went to school at the age of about five. Until then his speech was quite normal. He has always had a good attitude to school, except for one teacher with whom he had some difficulty. Mrs. - thinks that she was unduly abrupt with him. He does not appear to be over-conscientious and from his reports seems to do quite well.

He is not difficult at home, but is unwilling to go out much. He tends rather to play alone indoors. He is very timid with other boys.

He has given no trouble because of bad dreams or nightmares. In general, he seems to sleep well, although he slept badly recently during a serious attack of influenza, which was followed by a relapse, from which he is just recovering.

Mrs. - thinks that he is apt to be upset or "irritated" by loud music. She gives as an instance of this an occasion when she took him to a Mission Hall where a small band and organ were playing. John "came out in a cold sweat" and had to be taken out. He then cried to be taken home. Mrs.- thinks that he has been rather spoiled by his grand-parents, he being the first grand-child and the only child in the house. She suggests that he gets a good deal of his own way.

The stuttering varies a great deal and is sometimes very severe. Mrs. - took him to the Sick Children's Hospital for advice regarding his speech trouble. He was seen there by Dr. Alexander who suggested that it would pass off.

INTERVIEW WITH JOHN :

On his first visit to the Clinic John was very timorous and in a highly nervous state, but this gradually diminished. He refused at first to leave the waiting-room for examination and could only be persuaded when his mother was allowed to come with him. He was, however, quite content when he was told that she was just outside the door.

The stuttering was very marked and persisted throughout the conversation. In John it takes the form of a complete stop on the initial letter of nearly every word, during which the lips are pressed hard together and the facial muscles are obviously tense. Usually the stop breaks quite suddenly and the whole word is pronounced in an explosive burst.

His lips are not thickened or prominent. His chief amusements at home are drawing and listening to the gramophone which he can manipulate himself. On Saturday afternoons he is in the habit of going to the pictures, but this has been forbidden recently by the doctor for fear of undue excitement.

He says that he likes school and his favourite subjects are spelling and drawing.

In view of his nervous condition no attempt was made to test the boy's intelligence. It was recommended that he should come regularly to the play-room on Saturday mornings for further examination and in order that he might meet other children of his own age.

Information supplied by Mr --, maternal grandfather, with whom the boy lives.:

All the children are nervous. John quarrels a great deal with his sister and does not like his sister to visit the grandfather's. The grandfather is afraid that he has spoiled John. He feels that this is partly accounted for by the fact that he felt the boy's parents were too hard with him and he felt he wanted to avoid being the same. The parents used to put him out in the dark lobby when he was naughty and shut all the doors. John used to scream with terror when this was done. He is a very nervous boy. He is afraid to look down/

down from high windows. The grandfather believes that his teacher is very strict. John is so afraid of being late that he goes to school half an hour early, although the school is quite close at hand. John is afraid of traffic and holds his grandfather's arm very tightly when he crosses the streets. Recently his grandfather took him to the Playhouse Cinema. They sat in the gallery and John was terrified by the height of the gallery. He screamed and said "Take me out". He used to be afraid of sleeping in the dark, but is better in this respect. He used to be afraid to go to the lavatory which is dark, unless the doors were kept open, to admit some light. He does not like mixing with other children. He prefers being with his grand-parents to playing with other children. He spends a great deal of time drawing. Recently he saw the film "Svengali". This film terrified him. He was particularly afraid of Svengali's eyes. He sweated all over with terror and his grandfather had to hold his hat over the boy's eyes. John likes cowboy films, but gets very excited when he sees them.

John sleeps in a room alone. He sleeps well.

When John tries to speak he twitches. His father twitches also when speaking, but does not stutter. John seems to choke in trying to get the words out. He does not appear to be addicted either to nail-biting or to thumb-sucking. He is rather particular about his food. There are certain articles of food which he refuses to take - for example, currants. He is fond of soups. He has a good appetite at present. There is no history of enuresis. He is retentive with his motions. He is very clean and tidy. He is quick-tempered. John was in the Cubs for a few months, but gave it up. His mother is a Sunday-school teacher and takes part in the Missions in the Canongate.

Further Interview with John. John says that he sleeps well, but dreams a good deal. Examples of dreams:-

- (1) Dreams about cowboys and Indians, in which he is a cowboy and fights with indians and kills them.
- (2) Dreams about someone coming up to his bed and feeling for a gun in it.
- (3) Dreams about being in an aeroplane and racing other aeroplanes.

In more formal test-situations, the following observations of his speech were noted.:

During silent reading, John vocalised to a considerable extent, and there were obvious movements of the lips. His speech during stuttering sounds as if he had a bad cold in the head, "m's" and "n's" becoming "d's". For example, - "man" becomes "bad"; "mother" becomes "bother"; "nine" becomes "dine"; "near" becomes "dear"; "entered" becomes "edtered"; "many" becomes "bany"; "persons" becomes "persods". "Th". "F" and "s" are all prolonged considerably.

He did not stutter at the Nerve Hospital when taken there for experiment by Dr. Westburgh and the disorder was much less obvious to-day than on his first visit. It is pronounced in reading material well within his grasp, but diminishes, although it does not disappear, when someone reads along with him. It was still present and pronounced when he was left to read alone and was present also in whispered reading. He reads rhythmical verse well and so long as he is able to maintain the metre there is no speech trouble, but the tendency for "m" to become "d" still remains.

Information obtained from a reliable source indicates that a child of his nervous type could not well have a more unsuitable teacher than John has at present. Apparently from the description, herself abnormal, she hectors and bullies the individual children and the class as a whole in an unconscionable manner, and rates John roundly for his disability.

October 26th, 1932.

The following information was obtained from the mother on John's reappearance at the Clinic at this date.

The father is still at Bangour and does not appear to be making any marked progress.

Trouble has arisen in John's case within the last few months in the form of "nervous turns". These appear to come on during the evening at home rather frequently. The boy is aware and can announce their onset. He feels sick, comes out in a cold sweat and trembles all over.
John/

John himself says that "my legs turn weak and my hands turn sweating."

Some details in recording the earlier history fall to be added here:- John's birth, besides being difficult, was premature - 8 months. In the course of training in control of the bowel and bladder function napkins were discarded at 18 months and there is no history of subsequent voluntary retention or constipation. No digestive disorders of any kind are reported.

The boy is still in the same class at school and with the same teacher, Miss - . John never mentions the teacher or the school situation at home. The grandfather has on one occasion written to the school with regard to the teacher's treatment of the child, and a promise was then given that the teacher would give him consideration and take time with him. Recently John has been inclined to come in from play with other children and say that he has not been feeling well. The mother now says very emphatically that he is a "terrible boy if you give him his own way". He cries when he is in a temper and is markedly aggressive and ill-tempered in his dealings with his young sister. He becomes angry if the youngest child meddles with his toys. He is said to be "awful pernickety" and specially particular about his appearance.

John's account of the school situation and of his attitude to it on this occasion differ very little from the information previously obtained. He still worries about lessons, "sometimes when he thinks he is wrong", and complains of the teacher shouting at him and strapping him "because sometimes he has five errors in spelling"

On the occasions of the nervous attacks he feels sick and weak. There is no report of any such attacks in school, but he had to go home recently from the Hallowe'en party in the Cub Pack of which he is a member, because he felt sick. Sometimes on such occasions he goes out to play and he then feels better in the fresh air.

He reports dreams of :-

- (1) Cowboys. (2) "Stories the teacher told". (3) Comics in the pictures.
 - (4) About Christmastime, that he got a fairy cycle.
 - (5) About bonfires and camp fires in the Cubs.
- No dreams of falling.

October 26, 1932.

John also reports the following dreams :- (1) He dreams about tigers and lions in the Zoo. (2) Dreams about his teacher punishing him.

John's mother states that lately he has often said that he felt ill in the evenings. On such occasions he says he feels sick and expresses the idea that he is going to die. He gets clammy all over and his heart races at a terrible rate. These states pass off as a rule in about half an hour. From the account given it is evident that they are acute anxiety attacks.

The mother states that John never speaks at home of what happens at school. She has noticed that he is not "putting on flesh", and it would seem that he has actually lost some weight recently.

During the interview John was constantly coughing. The cough appeared to be of a nervous character.

PHYSICAL EXAMINATION.

Nothing special to note in physical examination.
History of influenza with discharging ears.

October 26th, 1932.

When examined on this date John's pupils were very dilated. His knee-jerks were also markedly exaggerated. Throughout he had a constant cough which appeared to be of a nervous origin. No local condition to account for the cough was revealed by examination of his throat.

PSYCHOLOGICAL EXAMINATION

Intelligence.

Herring Revision.

Group A	M.A. = 10 yrs.	I.Q. = 108)
Groups A & B	M.A. = 9 yrs. 6 mths.	) I.Q. 105
		L.Q. = 102)

PSYCHOLOGICAL EXAMINATION, cont.

Burt's Graded Reading
Reading Age = 10.4

<u>Handedness</u>		<u>Dynamometer</u>			
Scissors	R.	R.	15.5	14.5	14
Ball	R.				
Folding	R.	L.	14.5	13.5	13.5
String	R.				

Scholastic:

Spelling : (Burt's Graded Vocabulary Test 6).
Score = 51 E.A. = 10.1 E.Q. = 103.5.

Character & Temperament

Pressey X-O Test.

Test 1 Underlined 64
 Circled :- Boating, camping, Napoleon, athletic girls, studying, acrobats, bands, hymns, good boys, clothes, pageants, coffee, teaching, artists, Mowgli, church, history, sports, college, nurses, poems, switchbacks, professors, circuses, fishing.

Test 11 Underlined 42
 Circled:- Spitting, laziness, silliness, boasting, slang, bluff, kidnapping, day-dreaming, fault-finding, swearing, stupidity, fighting, grumbling, slyness, kidding, stealing, strike, bullying, over-eating, borrowing, bragging, tale-telling.

Test 111 Underlined 7.
 Circled :- Sickness, self-consciousness, fire, death, enemies, storms, fainting.

MEDICAL REPORT

- (1) Height52 ins. Weight.....62½ lbs.
 (2) Circulatory System:
 Pulse Rate 82

Any abnormality of
 Heart Action 1st sound rough ..Rheumatic

- (3) Respiratory System:
 Expansion of Chest1¾

Any deformity of Chest
 and its nature No

- (4) Nose, Throat and Mouth:
 Presence of enlarged
 Tonsils or Adenoids Removed in Infancy

 Presence of Nasal
 Obstruction Adenoids

Any structural abnormality
 of teeth (rickets etc.)Irregular bite

Any structural abnormality
 of palate Highly arched

Any structural abnormality
 of throat No

Prominence and thickness
 of lips or otherwise No

- (5) Nervous System:

 State of Pupils: Moderately dilated
 Re-action to light Yes
 Presence of deafness No
 Tremor No
 Knee-jerks Slightly exaggerated
- (6) State of Skin : Healthy
-

TEACHER'S REPORT

- (1) Average age of class 9 yrs.
 (2) Position in class 30/43
 (3) General quality of work Fairly good
 (4) General attitude to work Careful
 (5) Does he show any desire to
 be near the top of his class? Sometimes
 (6) Is he nervous in class? No
 (7) Is he willing to answer questions? Yes
 (8) Does he read or recite in class?
 or is he merely passed over Occasionally -
 When time permits
 (9) Does his work show any specific
 defects, e.g. very poor spelling,
 poor arithmetic Slow at arith.
 (10) Is he punished frequently? No
 If so, for what type of
 misdemeanours?
 (11) Does he always stammer? Yes
 If not, when is it least,
 and when most evident?
 (12) What are his relations
 with other children? Quite normal
 (13) Is he a leader in play? No
 (14) Is he frequently absent
 from school? If so, why? Atten. 292/350
 Absent because of illness

Case 2

Age 9 yrs. 4 mths.

P. or G. Both alive and well.
 B. Two, aged 5 years and 1 year respectively
 S. One, aged 4 years. Class. Jun 11 B
 (Miss Robertson) Q. No
 W. Early, about 12 months (?). T. 12 mths.
 L. Diphtheria, followed by septic poisoning at 2½ yrs.
 Measles. Subject to colds.

PROBLEM. STUTTERING.

FAMILY HISTORY. Present conditions at home seem to be bad. The father who, according to himself, "does nothing", has been unemployed for over two years. The following information was supplied by the father and is in some places rather uncertain.

There is no evidence of left-handedness or of definite instability on either the father's or the mother's side. There has been no stuttering either in earlier generations or in any of Peter's brother's brothers or sisters. Neither the father nor the mother stutters.

PERSONAL HISTORY. Mrs - was in good health at the time of Peter's birth and Mr - does not think that there were any special difficulties, but the mother was operated upon a short time later for a diseased ovary. Peter was breast-fed only for a short time, after which he was bottle-fed. Mr. - can only say that there was no great trouble over feeding, that he does not think Peter cried much, and that a comforter was not used.

At present Peter has his meals at school. He has a good appetite and shows no marked dislikes for any kinds of food, except for some kinds of soup.

His general health is good.

There is no evidence of thumb-sucking and he does not bite his nails. There has been no trouble over enuresis since he went to school and he was easily trained to cleanly habits.

Peter seems to like school. From the beginning he went freely and by himself. He does not appear to worry about school and his progress seems to be satisfactory. Mr - does not think that there is any great difference in age between Peter and the rest of his class.

At home he is seldom in, but goes out to play a great deal. He is not frequently punished. On the whole he plays freely with other children and is not timid.

He sleeps with his smaller brother and does not have nightmares. His father does not think him an excitable child. His stuttering is said to be very slight and to occur at home only when he is excited. Mr. - thinks it began after the early operation on his neck. Until this, his speech had been/

been quite good. No other obvious contributing cause is indicated. Peter is not left-handed.

INTERVIEW WITH PETER

Peter was somewhat flushed during conversation on his first visit to the Clinic, but was quite talkative and not unusually nervous. He says that he likes school and his teacher. He is a member of a gang. They make tents together and "kid they're on horseback". He dreams about ghosts with black pointed hats and with long black coats. These he described very vividly. He says that he is afraid when he dreams about them.

In this conversation the stuttering was, if anything, less in evidence than some other defects of articulation. His speech generally is slovenly, his teeth being kept close together during articulation. In particular the letter "s" is badly hissed. During silent reading there was marked vocalisation and obvious lip movement. The stuttering itself appeared usually in the form of a preliminary hesitation or tuning in, (eh-eh-eh-eh-eh), before he could start to speak.

During spontaneous speech and conversation even when there is little stuttering, Peter shows a tendency to convulsive clutching at the genitals.

Further Information supplied by Mrs. -

In the main this simply confirms the information already obtained from Mr -. There was no difficulty at Peter's birth, but a short time later, Mrs. - was operated upon for an abscess in the ovary. The ovary itself was not diseased. Peter was breast-fed for only 10 days and for the next three months, while his mother was in ill health, he was looked after by his grandmother and bottle-fed. During that time he thrived much better than he had done at the beginning. Before the serious septic poisoning during diphtheria (see above), he had one or two abscesses during teething, which had to be lanced. Since the operation for septic poisoning he has had almost continuous trouble with a discharging ear. Peter eats a lot and appears especially to want food at night. Although Peter is not himself troubled with enuresis, his smaller brother/

brother, aged five, is still given to frequent bed-wetting. Enuresis was common in the mother's family.

Peter's reports from school have been generally good, both as regards behaviour and progress. Mrs. - suggests that he seems to be rather easily led. She has taken some trouble to prevent his consorting with an older boy who seemed to dominate him. He is quite talkative at home, does not stutter much, but hesitates when excited. He has never been scolded for the speech difficulty, but his parents have tried to make him take time. He is generally well-behaved at home, orderly and helpful, being quite ready to do small tasks about the house. He seems to be nervous and much afraid of being struck. He is not afraid of the dark, however, nor of animals. He talks in his sleep about play.

PSYCHOLOGICAL EXAMINATION

(A) Intelligence

Chronological Age = 9 yrs. 4 mths.

Herring Revision

Group A M.A. = 9 yrs. 7 mths. I.Q. = 103)

Groups A & B M.A. = 8 yrs. 4 mths. I.Q. = 89) I.Q. = 96

(B) Scholastic Achievement

Spelling: (Burt's Graded Vocabulary Test 6).

Score = 42 E.A. = 9.2 E.Q. = 103.

Character & Temperament

Pressey X-O Test.

Test 1 Underlined 41

Circled :- Beaches, football, kissing, reading, talking, singing, hymns, good boys, clothes, ice-cream, teaching, prayer, sports, housekeeping, teachers, poems, doctors, racing.

Test 11 Underlined 27

Circled :- Smoking, silliness, talking-back, slang, revolution, meddling, spending, swearing, fighting, grumbling, cunning, kidnapping, pitch and toss, lock-out, yelling/

Test 11, cont. Yelling, borrowing, quarrel, tale-telling.

Test 111

Underlined 20

Circled:- Forgetfulness, sickness, worry, fire, enemies, police, storms, giggling, nightmares, drowning, gun, burglars, knives, roughness.

Handedness

Dynamometer

Scissors R.	R.	12	12	11
Folding R.				
String Ambi.	L.	11	11.5	9.5
Ball R.				

TEACHER'S REPORT

- (1) Average age of class9 yrs.
 - (2) Position in classMiddle
 - (3) General quality of workFair
 - (4) General attitude to workCareful
 - (5) Does he show any desire to be near the top of his class ?Seems to try
 - (6) Is he nervous in class ?No
 - (7) Is he willing to answer questionsYes
 - (8) Does he read or recite in class, or is he merely passed over ? ...I never pass over pupils.
 - (9) Does his work show any specific defects - e.g. very poor spelling, poor arithmetic, etc. ?No
 - (10) Is he punished frequently ?
If so, for what type of misdemeanours? No
 - (11) Does he always stammer ? Stammer is very slight.
If not, when is it least, and when most evident ?
 - (12) What are his relations with other children ? Aggressive
 - (13) Is he a leader in play ? Cannot say
 - (14) Is he frequently absent from school? No
If so, why ? .. .
-

Cast 3

Age 9 yrs. 8 mths.

P. or G. Both alive (see below).

B. Four; James, aged 11, Duncan, aged 8, David, aged 5 and Walter, aged 3.

S. None.

W. About one year. Class. Sen 1C Q. (No).
T. About one year.

I. Diphtheria (about 3 years); scarlet fever (5, 6, and 8 years); measles, chickenpox; not subject to colds; tonsils and adenoids during diphtheria.

PROBLEM. STUTTERING.

Information supplied by mother:

FAMILY HISTORY. Home conditions seem to be rather poor. The parents were married after the war. The father is unemployed for health reasons. He was slightly wounded during the war and suffers from bronchitis, tuberculosis and malaria. He has a war pension, now reduced to 16/- per week. Mrs. - who supplied the following information, appears to be something of a termagant and took up rather a truculent attitude during the interview. She appears to be hard on Philip, an impression which was confirmed by subsequent conversation with the boy himself.

There is no evidence of left-handedness in any members of the father's or the mother's families.

PERSONAL HISTORY There were no special difficulties connected with Philip's birth and Mrs. - was in good health at the time. He was breast-fed for the first year and was weaned quite suddenly, but gave no treat trouble. He refused a comforter. His appetite is good, indeed Mrs. - says that he is "always eating" even between meals. He does not like vegetables and broth. Thumb-sucking persisted for a very long time, even until Philip had gone to school. Mrs. - always used to slap him for it. He does not bite his nails.

Mrs. - says that there is still continual nocturnal enuresis. He is not punished for this, but he is given no liquid of any kind after 6 o'clock. He has "a piece" before he goes to bed. Philip goes to bed shortly after 6 o'clock every/

every evening and the boys all sleep together. Philip is always up first at 5 a.m., even on Sunday mornings. Philip's elder brother is also subject to nocturnal enuresis. In his case the family doctor has said that it is due to a weak bladder and a bad liver.

Philip starts for school, which is just a short distance away, by 10 minutes to eight.

He was early trained in habits of cleanliness but there is some indication that voluntary retention of the motions of the bowels occurred at an early age.

At first he had no difficulty in speaking. He still sings well, but speaks very badly when he is excited. The only attempt to deal with the speech disorder has been made by his father, who has tried to make him take time. Philip is not left-handed.

Philip began school about the age of $4\frac{1}{2}$. He went at first quite willingly with his older brother. He does not seem to worry about school and he had a bad report on his work for the first time last session. He likes his present teacher, but not the headmistress of whom he is afraid.

At home he is very troublesome. His mother says that he is always being checked and that he is very ready to speak back. There was some small stealing trouble some time ago which was not made quite clear. At that time Philip was frequently in the company of boys older than himself. Philip appears to be aggressive at home. He "wants to be boss" and likes to get his own way. When he gets a leathering, which appears to be a not infrequent occurrence, he goes into hysterics, but is quite amenable and will do anything after it. When he has been in Hospital the nurses have always said that he was a very good child. At home he is always fighting. He has no special fears and is not afraid of the dark. He goes out to play quite willingly.

His mother says that Philip is very excitable ; that he is very talkative, but frequently cannot get the words out. He is very kind to smaller boys in the family and trouble arises only with his older brother. He has always been given to speaking in his sleep and still does so very frequently.

INTERVIEW WITH PHILIP

On his first visit to the Clinic, Philip soon became very talkative indeed. During the conversation his stuttering was very severe. His speech generally is bad, showing a marked glottal stop and a poor variety of slovenly scots. The stuttering takes the form of a peculiar sucking and indrawing movement of the lips and his utterance is characteristic of the speech of a child who is sobbing violently. Spasmodic intake of breath occurs frequently, so that aspirates appear in quite unusual places, especially between an initial consonant and a following vowel. For example, "come" becomes "c-hu-hu-hum" and "kill" becomes "k-hi-hi-hill". "very" becomes "v-he-he-he-hery" and "read" becomes "r-he-he-head". He does not appear to be attempting to speak very rapidly; for example in pronouncing a word beginning with the letter "s", he repeats the sibilant several times and quite slowly before he can utter the word itself. He says himself that he stutters most "when he gets big words".

He says that he likes school and his present teacher. He is good at arithmetic and is near the top of the class in the examinations. He is fond of reading and obtains books from the library in connection with the Cub Pack of which he is a member. He often gets the strap at school, according to his own account, for talking and bad writing. He has had the strap from the headmaster for climbing over nearby allotments for his ball which had gone through from the playground.

After he has done his home-work in the evening he goes out and plays football. The other boys, he says, hit him on the back to stop his stuttering. His general attitude appears to be marked by pronounced compensatory aggression and was well expressed in several spontaneous utterances. For example, "I kick one boy I can't batter for calling me "Stuttery".

His attitude towards home appeared to be characterised partly by the aggressive tendency already noted - the reaction of the "second child" - and partly by a certain (probably justified) feeling that he was being ill-treated. There were some indications that he feels that he suffers most and most unjustly at the hands of his mother and that he was experiencing real relief in being allowed to talk freely/

freely of himself and his home relations. His conversation, owing to the continuous distortion of his speech, especially as regards phrasing and rhythm, was difficult to follow.

He says that he has a cold bath every Sunday morning ; that he is punished at home, but "Dada never lets mama hit me. She always does when I do anything bad". He likes his father better than his mother. Among other things, he said "I'm the bully o' the hoose". "I'm the earliest riser in the hoose." He gets up about 6 o'clock in the morning, frequently makes breakfast, sets the table and "masks the tea." When his father is not going out to work (he appears to work sometimes at the docks), his mother gets up. Philip goes for rolls in the morning. He is early in bed, but is later on Fridays (about 9.30 p.m.) because of the Cubs. He says that he himself never wets the bed, but that it is his elder brother who does.

He gave an account of two dreams. (1) He heard his mother crying that there was a man in the house. His Daddy was at the back door. The man wounded his daddy on the arm. The man said "he was going to take one of us away". Philip felt afraid. N.B. His father was wounded on the arm during the war.

(2) "I dreamt that there was a fire and I went away in the fire. I got a wee bairn and I gi'ed it to its ma and its ma gi'ed me a threepenny and in the monrin' I was looking fir the threepenny in my pockets and it wasna there"

PSYCHOLOGICAL EXAMINATION

Handedness

Scissors R. Folding R. Ball R. String R.

Failed to return for further examination.

MEDICAL REPORT

- (1) Height50 ins. Weight64 $\frac{1}{4}$ lbs.
- (2) Circulatory System:
Pulse Rate 88
- Any abnormality of
Heart Action No
- (3) Respiratory System:
Expansion of Chest 27 $\frac{1}{2}$ " 2 $\frac{3}{4}$ " expansion.
- Any deformity of Chest
and its nature No
- (4) Nose, Throat and Mouth :
Presence of enlarged
Tonsils or adenoids Nil
- Presence of Nasal
obstruction ...slight (card given)
- Any structural abnormality
of teeth (rickets etc.) ..No
- Any structural abnormality
of palate ..No
- Any structural abnormality
of throat No
- Prominence and thickness
of lips or otherwise No
- (5) Nervous System:
- State of Pupils: Moderately contracted;
Re-action to light Yes
Presence of deafness No
Tremor No
Knee-jerks Neither exaggerated
nor diminished.
- (6) State of skin : Healthy.
-

TEACHER'S REPORT

- (1) Average age of class 9-10 years
 (2) Position in class 35/48
 (3) General quality of work Poor
 (4) General attitude to work Careless
 (5) Does he show any desire to be near the top of his class?.. No
 (6) Is he nervous in class ? No
 (7) Is he willing to answer questions ? Yes
 (8) Does he read or recite in class, or is he merely passed over? Reads or repeats small passages.
 (9) Does his work show any specific defects - e.g., very poor spelling, poor arithmetic, etc.? Poor arithmetic
 (10) Is he punished frequently?No - when punished
 If so, for what type of misdemeanours? it is usually for misbehaviour in playground
 (11) Does he always stammer?Yes
 If not, when is it least and when most evident?
 (12) What are his relations with other children?Confident
 (13) Is he a leader in play ?No
 (14) Is he frequently absent from school ?No
 If so, why?
 (15) Please add any information you think might be helpful. ..This child does try very hard at times, but does not seem able to concentrate for any length of time.

Case 4

Age 9 yrs. 10 mths.

P. or G. Both alive

B. Four: (a) 11½; (b) 8 yrs. 10 mths. (c) 5 yrs. 3 mths
(d) 5 yrs. 3 mths.

S. None

W. About one year

Q. (no)
T. About 18 mths

Case 4, cont.

- I. Diphtheria at 3 years (Hospital for 6 weeks); pneumonia, rather serious just after diphtheria. Tonsils and adenoids at 6 years. Subject to chest colds.

PROBLEM. STUTTERING

Information supplied by mother:

FAMILY HISTORY George's father is a brass-moulder, but has been unemployed for one and a half years. The family are at present living in a house consisting of only one room and kitchen. George's father is ambidextrous and his paternal grandfather was left-handed. The father does not stutter, but Mrs. - did so when she was at school and until she reached the age of about eighteen. She still does so a little in moments of excitement. She had a sister also who stuttered. The father and mother are in general in good health. None of George's brothers has shown any speech difficulty.

PERSONAL HISTORY. George's birth was not instrumental. He was a well-sized baby. Mrs.- was in good health when he was born and was not in a nervous condition. The father was unemployed at the time. George was breast-fed for one year and gradually weaned. At no time was there any serious trouble over feeding. As an infant he refused a comforter. Mrs. - does not think that thumb-sucking lasted long, but George was rather given to putting things in his mouth after he had reached an age when this should have stopped. This was forcibly prevented by the things being taken from him. He still bites his nails, but not badly. There has been no trouble with enuresis and no special difficulty of any kind in training him to habits of cleanliness. His appetite generally is good and he will eat anything that is provided. No special defects or difficulties were noted in George's early speech. He has never been left-handed.

His attitude to school is in general good. His reports are good, both as regards discipline and general progress. He was sent to school at the age of five, but at first he did not go very willingly. He is said to have been quite terrified of one teacher and even resorted to truancy to avoid school. Mrs. - took the matter up with the headmaster and George now likes school and is unwilling to stay away from it. He seems to work regularly, but not too hard and he does not appear to worry .

He/

He gives no trouble at home and is easily disciplined, but, according to his mother, he "cannot keep his tongue quiet". He is always wanting to tell something. In general he is orderly and well-trained. He is not much punished at home and is neither sulky nor quarrelsome. He is willing to go for messages, but would rather stay in than go out to play. Outside he is teased by the other children. He is not afraid of the dark, does not seem to be nervous and is not specially excitable. He sleeps with two of his brothers and has no nightmares. Mrs - knows of no specific contributing or causative factors likely to have produced the speech difficulty, except the diphtheria. Before this illness George's speech was quite good and the stuttering seems to have appeared after it. At times he has no trouble with speech, at other times he is very bad, especially when he has a cold, when he is excited, or when he tries to tell a story.

INTERVIEW WITH GEORGE

On his first visit to the Clinic George did not appear to be nervous, but had a pleasing, mischievous smile. His lips are slightly protruding. Through the conversation his pupils were rather dilated. His conversation was in the main about school. He says that he often gets the strap- often meaning "about once a week"- for talking, but he likes school and his present teacher. He still has quite vivid memories of his dislike for Miss Robertson (see information supplied by mother). She was always "crabbit". From his own account of his marks he seems to be reasonably good at arithmetic.

He says that he stays in the house because the street is always quiet and there is nobody to play with. At home he plays with the baby. Outside he likes to play at building houses.

In conversation the stuttering was not unduly pronounced, but some other defects of articulation and a peculiar tendency to insert an aspirate before initial vowels, - which may itself be a form of stuttering were prominent. Sibilants were in general badly articulated. In some words (e.g. something), but not in all those in which the sound combination occurred, "th" was pronounced as "f". Tested with single words, he manifested a repetitive stutter only on a few; - for example, the initial letters of Dover, gone, holiday, girl; but before all the following words he inserted an initial strongly-breathed aspirate/

aspirate, Anna, under, all, as, open, upper (although "up" was correctly pronounced), any, in, and.

PSYCHOLOGICAL EXAMINATION

(a) Intelligence

Chronological Age = 9 yrs. 10 mths.

Herring Revision.

Group A M.A. = 9 yrs. 7 mths. I.Q. = 97)
 Groups A & B M.A. = 8 yrs. 9 mths. I.Q. = 89) I.Q. = 93.

(b) Scholastic Achievement

Spelling. (Burt's Graded Vocabulary, Test 6).

Score = 48. E.A. = 9.8 E.Q. = 10.6

(c) Handedness

	<u>Dynamometer</u>
Scissors, R.	R. 11.5 10.5 9
Ball R.	
String R.	L. 9.5 10 10.
Folding R.	

MEDICAL REPORT

	<u>Class</u> Sen. 1c.
(1) Height .....46 $\frac{1}{2}$ ins.	Weight .....52 lbs.
(2) Circulatory System:	
Pulse Rate	....100
Any abnormality of Heart Action	....No
(3) Respiratory System:	
Expansion of Chest	....1 24" full expansion
Any deformity of Chest and its nature	....No
(4) Nose, Throat and Mouth:	
Presence of enlarged Tonsils or Adenoids	...T's & A's removed, aged 6.
Presence of Nasal Obstruction	...No

MEDICAL REPORT, cont.

- Any structural abnormality
of teeth (rickets etc.) ... No
- Any structural abnormality
of palate ...moderately arched palate.
- Any structural abnormality
of throat ...No
- Prominence and thickness
of lips or otherwise ...No
- (5) Nervous System:
State of Pupils: ... Moderately dilated
- Re-action to light
Presence of deafness
Tremor
Knee-jerks ...Slightly exaggerated.
- (6) State of Skin: Healthy.
- (7) Add any relevant information: Speech defect since had
Diphtheria age 3 yrs.

TEACHER'S REPORT

- (1) Average age of class10
- (2) Position in classMiddle
- (3) General quality of workGood
- (4) General attitude to workCareful
- (5) Does he show any desire to
be near the top of his class?No
- (6) Is he nervous in class?No
- (7) Is he willing to answer questions?Yes
- (8) Does he read or recite in class,
the class does.Does everything
- (9) Does his work show any specific
defects, - e.g., very poor
spelling, poor arithmetic, etc?No
- (10) Is he punished frequently? No
If so, for what type of
misdemeanours?
- (11) Does he always stammer?Yes
If not, when is it least, and
when most evident?

TEACHER'S REPORT , cont.

- (12) What are his relations with other children ?Confident
- (13) Is he a leader in play?Do not know
- (14) Is he frequently absent from school? ..No
If so, why?

Case 5

Age. 9 yrs. 3 mths.

P.or G. Both alive, father in Navy.

B. None

S. Two (a) aged 14 yrs. 5 mths. (b) 11.

Class. Jun. 11A.Q.No

W. About 18 months.

T. Early- about 12 mths.

I. Chicken-pox during infancy; whooping-cough; measles shortly after; influenza frequently; twice threatened pneumonia; discharging ears; scarlet fever; adenoids operated on July, 1931; Not operated for tonsils.

PROBLEM STUTTERING

FAMILY HISTORY. Information supplied by mother.

Mr. - is in the Navy and is frequently away from home for long periods. Mrs. - appears to be a superior, intelligent but perhaps rather hasty-tempered woman; ambitious as regards the children.

An aunt on Ian's father's side is left-handed and his own second sister. There is no evidence of stuttering or other speech disorder in any other members of the family. Mrs. - had to undergo a serious operation soon after the birth of the second child, with the result that she was anxious and very nervous during the third pregnancy, which was within a year after the operation. There was, however, no trouble over Ian's birth. In the case of both the girls the birth was instrumental.

PERSONAL HISTORY. Ian was never bottle-fed. He was breast-fed for 10 months, but had to be suddenly weaned at that time, because Mrs. - took cold. He then refused other food/

food for nearly a week. His appetite is generally healthy, but he does not like soup. A comforter was used until he was about 2 years old. There is no evidence of prolonged thumb-sucking, but he bites his nails badly now and checked by his mother every time he is noticed. There was no trouble over enuresis, he was early trained to cleanly habits generally, and there is no certain evidence of voluntary retention of faeces.

His early speech during infancy was good. The stuttering appeared gradually and became much more noticeable after the whooping-cough. He has never been left-handed (but if, note on handedness and teacher's report). He likes school and went willingly at first while the family were living at Rosyth. He does not appear to be over-conscientious about his school work and, so far as his mother knows, his age is about the same as that of other members of the class. He appears to do quite well in school work. He has never had difficulty with any of his teachers and Mrs. - thinks that his present teacher is very good and very sympathetic.

At home Ian is a very excitable child, loses his temper easily, flying into a tantrum and stamping his foot. He has to be punished rather frequently. He is teased by his sisters about his speech. Mrs. - says that he is always more amenable when alone with her. She considers that he is more obedient with his teachers and his father because, she thinks, he is afraid of them and she suggests that some degree of fear is necessary to obtain Ian's compliance.

When Ian was about three years old his father was away for the following four and a half years. As a small boy Ian hardly knew Mr - for his father, but there is now no difficulty here. Ian is not much smaller than his sisters, though they are older. He is not particularly tidy or orderly and has to be frequently told to put his things away. Here as elsewhere in Mrs. - account there is some suggestion of nagging. He goes out frequently to play and seems to get on well with other children. He used to be very sensitive to teasing, but appears to have overcome this now. He is neither quarrelsome nor timid, but can hold his own with other boys. There seems to have been some trouble over nightmarish/

nightmarish dreams, chiefly when he has had cold or indigestion. Then he is quite restless in bed and jumps about at night. There is some degree, probably slight, of fear of the dark. His mother notices that he sings without stuttering when he has to go into a dark room alone. He was rather a wild baby, given to climbing all over the place, and, in consequence, had frequent, though never serious, falls.

Ian eats well, is fond of milk puddings, but does not like stewed apples. He has always had trouble with indigestion. He used to be sick frequently. Now the stomach disorder manifests itself in an evil-smelling breath and thickly coated tongue. He is not constipated, but his diet has to be to some extent controlled and he has medicine, (Gregory's Mixture), twice or three times every week. Fatty soups and hard-boiled eggs always cause trouble of this kind. Mrs. - notices that the speech disorder increases in direct proportion with the stomach trouble. Similar digestive disorders appear in the girls.

INTERVIEW WITH IAN

Ian likes school and gets on quite well. At the moment he would like to be a sailor, as he says his father wants him to be. His mother, however, wants to send him to Heriot's. He is sometimes strapped at school. There he is teased by the other boys, who are punished by the teacher for doing so. He does not complain much of this teasing. He says that he is not afraid of the dark and does not dream very often. He likes going out to play and "hates reading books in the house". He admits that he quarrels with his sisters and "knocks them down on the couch".

In the first interview, the speech disorder took the form less of a repetitive stutter than of an intermittent hesitation during speaking, resulting in marked distorting of phrasing and speech rhythm. The letter "w" and the stop consonants in particular were prolonged. After an involuntary pause or hesitation the next few words would be uttered in a rush, but there was little definite stuttering in his conversation and his responses to questions.

(B). In the reading of isolated words (Burt's Graded Vocabulary), there was little or no manifestation of speech trouble during the earlier part of the test. Slight repetitive/

repetitive stuttering appeared as he passed beyond the monosyllables (e.g. s-steadiness, s-s-serious), and the words might be broken up by involuntary expiration, (e.g. la-bourers, lunch -eons). The disorder increased slightly as the words became too difficult for him.

(c) In the reading of continuous material (Burt's Comprehension 5), there was little obvious stuttering, especially while the vocabulary was distinctly within his capacity. He read expressively but the rhythm tended to be distorted by lack of breath which appeared also in decrease of voice so that the reading became at times almost inaudible.

(d) In reading along with the examiner (Teddy Bear), the speech disorder disappeared completely.

PSYCHOLOGICAL EXAMINATION

(A) Intelligence

Chronological Age = 9 yrs. 3 mths.

Herring Revision.

Group A M.A. = 10 yrs. 11 mths. I.Q. = 119)
 Groups A & B M.A. = 10 yrs. I.Q. = 108) I.Q. = 114

(B) Scholastic Achievement

Spelling : (Burt's Graded Vocabulary Test 6).

Score = 57. E.A. = 10.7 E.Q. = 103.

(C) Handedness

Note. Ian says that the school doctor told him to try to use his left hand because "he thought he had been born left-handed".

Folding	R.	<u>Dynamometer</u>			
Ball	R.				
Scissors	R.	R.	19	18	17.5
String	R.	L.	18	13	13

(D) Character & Temperament

Pressey X-0 Test.

Test 1 Underlined 29
 Circled:- Boating, football, Tennyson,
 flirting, walking, smoking, singing,
 hymns, handsome boys, games, clubs,
 ice-cream

PSYCHOLOGICAL EXAMINATION, cont.

Test 1 cont. ice-cream, typewriting, engineers,
Tarsan, church, history, sailors, travelling,
soldiers, poems, bargains, professors
cities, fishing.

Test 11 Underlined 45
Circled :- Spitting, anger, stinginess,
fibbing, boasting, slang, bluff, kidnapping
meddling, spending, gang, swearing, butting -
in, fighting, conceit, slyness, cunning,
greediness, stealing, strike, bullying,
yelling, drinking, sneering, tale-telling.

Test 111 Underlined 35
Circled:- School, fault-finding, meanness,
worry, disease, germs, medicine, tiredness,
insanity, dizziness, suffocating, poison,
society, movies, clubs, drowning, fainting,
burglars, neighbours, dogs, disposition,
stammering, roughness

MEDICAL REPORT

		Class Jun. 2a
(1)	Height 54½ ins.	Weight....63lbs.
(2)	Circulatory System:	
	Pulse Rate	.....76
	Any abnormality of	
	Heart Action	..... No
(3)	Respiratory System:	
	Expansion of Chest	..... 2"
	Any deformity of Chest	
	and its nature	.....No
(4)	Nose, Throat and Mouth :	
	Presence of enlarged	
	Tonsils or adenoids	.....Removed age 8 yrs.
	Presence of Nasal	
	Obstruction	..... No
	Any structural abnormality	
	of teeth (rickets etc.)	.....Jaw narrow, not
		sufficient room for lateral

MEDICAL REPORT, cont.

- (4) Any structural abnormality of teeth (rickets etc.) lateral incisors upper jaw.
- Any structural abnormality of palate Highly arched "gothic"
- Any structural abnormality of throat ... No
- Prominence and thickness of lips or otherwise ... No
- (5) Nervous System:
- State of Pupils :Moderately contracted
- Re-action to lightSlight (*abnormal* otonhoea several years ago).
- Tremor No
- Knee-jerks. Not *elicited* ~~elicited~~.
- (6) State of skin. healthy.

TEACHER'S REPORTClass. Jun. 11a

- (1) Average age of class ...Nine
- (2) Position in class ...Twelfth
- (3) General quality of work ...Very good
- (4) General attitude to workCareful
- (5) Does he show any desire to be near the top of his class ?No
- (6) Is he nervous in class ?Very restless
- (7) Is he willing to answer questions? ... Yes
- (8) Does he read or recite in class, or is he merely passed over ? ...Yes, he reads in class
- (9) Does his work show any specific defects - e.g., very poor spelling, poor arithmetic, etc. ? ...The lowest percentage in last exam. ..was 60 in arith.
- (10) Is he punished frequently ? ...No
If so, for what type of misdemeanours ?

TEACHER'S REPORT, cont.

- (11) Does he always stammer?Yes, it
 If not, when is it least, seems to be
 and when most evident? easier for him
 to read quietly
 than loudly.
- (12) What are his relations with
 other children ? ...Confident
- (13) Is he a leader in play? ... No
- (14) Is he frequently absent from school?
 If so, why ? No. 140/144 123/140
 (atts for last two quarters).
- (15) Please add any information
 you think might be helpful. It might be
 ... interesting to note that his sister is a "left-
 handed" child and that if he had been treated as such
 the stammer might not have been so evident. I am
 trying to make him use his left hand in his writing
 lesson.
-

Case 6.

Age. 9 yrs. 5 mths.
P. or G. Both alive.

B. One, aged 5 yrs. 5 mths.
S. None.

Class. Sen. 1B.Q. (No)

W. About 15 months. T. About 11 months.

I. Whooping-cough at 3 yrs; very seriously ill with diphtheria at 7; measles at 7½; chickenpox about 6 months later; not operated for tonsils and adenoids; general health very good, though his heart was weakened for a time with diphtheria anti-toxin.

Problem. STUTTERING.

Information supplied by mother.:-

FAMILY HISTORY. The father, is in business in town as a fruiterer. Both he and the mother appear to be above average intelligence. The mother appears to be a very capable, vivacious, talkative and rather excitable woman. Stewart's maternal grandfather is left-handed. The mother herself is so for some things and in earlier childhood Stewart himself was left-handed. Mrs. - stutters slightly if she is excited and a paternal grand-uncle also does so to some extent. Mrs. - says that she is herself nervous and excitable, but that the father is not at all so. Seen at the Clinic for a short time, the father proved to be decidedly aggressive.

PERSONAL HISTORY. The mother was in good health just before Stewart was born and he had a natural and very easy birth. He was a healthy baby, weighing 6½lbs, at birth and his birth increased with great rapidity. Stewart was breast-fed only for a few days, when he had to be weaned suddenly because the mother developed abscesses in the left breast. Thereafter he was bottle-fed, but no noticeable trouble arose as a result of the change over. His appetite is generally healthy. He dislikes soup, is fond/

PERSONAL HISTORY. cont.

fond of potatoes and eats a great deal of fruit and vegetables. A comforter was not used. It was tried, but the child persistently refused it. There was no continuous prolonged thumb-sucking, but he sometimes bites his nails and does so now. There has been no trouble with enuresis since Stewart was 8 months old and he was easily trained in control of the bowel function.

Stewart's early speech was good. No speech defects other than stuttering have manifested themselves. The mother traces the stuttering back to the diphtheria mentioned above, but on closer investigation she will not say definitely that there was no trace of it before this time, although she thinks that it has grown decidedly worse since then. He stutters worst when he is excited or in the presence of strangers, i.e. persons outside the family circle. His small brother's speech is quite good. He used to be slightly left-handed but is not so now. He likes school and always went willingly. He did not have to be taken to school after the first few days. He seems to do well in his school work; does not over-work at home and seems to be under-than rather over-conscientious. This is the mother's estimate and there is some suggestion that she thinks he might do more. At home he is very talkative and mischievous, but generally obedient. He is not particularly orderly and is not frequently punished. He has never been punished for the speech trouble. He plays outside a great deal and very willingly. He does not stutter when he is with other boys; is not quarrelsome; is sometimes a leader and is timid only in the dark, but not about anything else. He has a habit of singing at home, especially in the dark to keep his courage up. He reads a great deal. There has been no trouble over nightmares. He had a bad fall on his head at the age of about $4\frac{1}{2}$, but this seems to have had no undesirable consequences. The only possible contributing factor that the mother remembers is that when Stewart was three years old his chief playmate was a small boy, who lived opposite and who stuttered very badly.

INTERVIEW WITH STEWART:

Stewart proved to be a very pleasant child and, in conversation displayed a good and reasonably confident attitude. He is quite willing to talk about himself and displays a fairly strong competitive tendency with regard to school. He says that he is there "fifth dux" of the class. He would like to be an aviator. He/

INTERVIEW WITH STEWART. cont,

He is going to join the Cubs soon. He reads a lot - school stories, "Comics" and stories of adventure. He dreams sometimes, but says that he cannot remember what he dreams about. He stutters a little with other boys, but is not teased by them. He stutters worst in school.

Notes on the nature and degree of the speech-disorder:-

He reads isolated words without stuttering at all. In reading material well within his capacity (A.A.Milne's "Teddy Bear"), there was not much distortion of speech or verse rhythm, and only a slight tendency to stutter on initial letters - especially "f", "w", "t", "k" and "d". At other times the speech disorder appears simply as a halt or as an interpolated er-er, or in the repetition of whole words or word groups. For example, "and she's, and she's". Along with this last there may be over-emphasis of initial letters in the various stop positions; e.g. "t", "k", "d", although these letters are not repeated. When this happens the transition to the following vowels appears to be momentarily held up.

PSYCHOLOGICAL EXAMINATIONIntelligence: -

Chronological Age = 9 yrs. 5 mths.

Herring Revision.

Group A M.A. = 10 yrs. I.Q. = 106

Groups A & B M.A. = 10 yrs. I.Q. = 106

N.B. In test 2, Number series, he failed altogether to score.

Scissors - R. String R. Ball- R. Folding R.

Dynamometer.

R.	15	11	12
L.	12	13	12

TEACHER'S REPORT

Class. Sen. 1B

- (1) Average age of class 9½ yrs.
- (2) Position in class 12/23 (boys)
- (3) General quality of work.....very good.
- (4) General attitude to workcareless on the whole, but attentive.
- (5) Does he show any desire to be near the top of his class? No
- (6) Is he nervous in class? No
- (7) Is he willing to answer questions?..... Most keen. Usually the first volunteer.
- (8) Does he read or recite in class, or is he merely passed over? Reading and Recitation Lesson. Rushes at his work in a careless manner.
- (9) Does his work show any specific defects - e.g., very poor spelling, poor arithmetic, etc.?In set work he is the first to be finished. e.g. composition - This shows very poor work. Spelling though usually VG is careless words omitted etc. Figures are carelessly formed.
- (10) Is he punished frequently?.....No.
If so, for what type of misdemeanours?
- (11) Does he always stammer?Most evident when excited.
If not, when is it least, and when most evident? Worst attack was when called upon suddenly to read.
(This is not the usual plan adopted in class).
- (12) What are his relations with other children? ..Confident.
- (13) Is he a leader in play?..... Yes.
- (14) Is he frequently absent from school?..... No

Most intelligent. Is of a very happy nature. Possesses keen

TEACHER'S REPORT

sense of humour. The most reliable boy in the class to carry out an order. Seems to find it impossible not to chatter unceasingly to his neighbours in class.

Case 7.

Age. 11 yrs. 6 mths.

P. or G. Both alive.

B. Four (A) 16: (B) 14: (C) 12: (D) 2.

S. None

W. About 12 months.

T. About 12 months.

I. Measles (9mths.) whooping cough soon after; mumps; Not subject to colds; not operated for tonsils and adenoids; general health said to be good. Q. No.

Problem STUTTERING.

FAMILY HISTORY: The information was supplied by the mother. The father is a rubber worker and has suffered from asthma and bronchitis since the War. The mother has had diabetes for seven years and, on her own account, is "full of nerves". She has been for several periods in the Royal Infirmary under treatment for diabetes.

The third boy, who is just older than Clarence, is to some extent left-handed. There is no other evidence of left-handedness in the family. The eldest brother stutters. The speech disorder in his case is said to be the result of a shock when he was hit with a stick behind the ear in childhood. At that time he was delirious for a day or two and stuttering supervened. The mother thinks that Clarence imitated him. No other members of the family stutter. There is no evidence of other speech disorders in the family.

PERSONAL HISTORY: Just before Clarence was born the mother was suffering from anaemia, but birth was easy and natural and instruments were not used. Clarence was never breast-fed. Until he was five months old he was a bottle baby, but from that time he refused a bottle. All his brothers had also refused it at an early age. As an infant Clarence was not troublesome/

Case 7. cont.

troublesome over feeding. He was a healthy baby and not unduly irritable. On principle the mother never used a comforter. His appetite is nearly always good. He refuses nothing and is very fond of soup. There is no evidence of prolonged thumb-sucking. He used to bite his nails, but this has now stopped. There is no trouble over enuresis, training having had satisfactory results by the age of one and a half years. He was easily trained to cleanly habits, and there is no history of voluntary retention.

Clarence is not left-handed and has never been so. He spoke quite well at first and stuttering did not appear until he was about four years old. He went to school at the age of four and a half and the mother is not certain whether the speech disorder appeared before or after that time. Clarence likes school, but he was happier at Dalry Public School, where he was until two (?) years ago, than he is now at St Nicholas Special M.D. School. The mother thinks that he is making no progress and indeed is falling further behind in school work than he need do since he went to his present school. Although her attitude to the Education Committee's action in sending him to the special school is reasonable, she thinks that the company there is unsuited to the boy. She understands only vaguely that it is a school for mental defectives. He was originally sent to the special school because of retardation in school work. This, the mother says, is due to the fact that while she was in the Royal Infirmary at that time, the assistance she used to give him with his home work had to stop. The chief measure that she has taken to deal with the speech trouble has been to stop him so that he had time to recover himself before proceeding with his speech. The stuttering has not diminished at all while he has been at the special school, and is always at its worst during the school terms. During the recent school holidays he hardly stuttered at all. So far as the mother knows he has never any serious disciplinary trouble at school.

At home he is ordinarily talkative, easily disciplined and not punished much. He is not quarrelsome and rather orderly. He goes out to play willingly and appears to be nervous only about being punished. He has been punished (smacking) sometimes for stutering, but the mother realises that this is not the best method of dealing with the trouble.

There is no evidence of nightmares. He is not afraid of the dark and there is no indication of other fears. The mother thinks that he is excitable and she says that for this/

this reason he sometimes cannot get the word out. About the age of four, before he went to school, he fell down - stairs and cut his chin, but the accident was not serious .

INTERVIEW WITH CLARENCE:

Clarence's attitude during conversation was not suggestive of serious mental defect. Although rather shy at first, he displayed a certain humorous appreciation of the situation. He says that he likes school, but would like very much to go back to Dalry, because "all his pals are there". The stuttering diminished considerably during the interview.

The speech disorder appeared almost wholly on initial letters, either vowels or consonants. For instance:- a-a-a-and, i-i-i-isn't; k-k-k-quite, l-l-l-like, t-t-t-top, u-u-wh-wh-wh-where.

These examples all appeared during continuous reading of "Half-way Down", by A.A. Milne.

PSYCHOLOGICAL EXAMINATION

Dynamometer -	R.	16	R. 15.5	R 17
	L.	16.5	L. 15.5	L.15

Ball R.	Folding R.	Scissors R.	String R.
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Intelligence

Chronological Age = 11 yrs. 6 mths.

Herring Revision.

Group A	M.A. =	7 yrs. 9 mths.
Groups A & B	M.A. =	7 yrs. 4 mths.

This is not a fair test of the child's intelligence, however, because he scored nothing in all the reading tests, on account of his reading defect.

Character & Temperament.

Pressey X-0 Test. (In view of reading disability, unsatisfactory).

Test 1/

Case 7, cont.PSYCHOLOGICAL EXAMINATION, cont.

- Test I Underlined 53.
 Circled:- Boating, eating, Edison, kissing walking, smoking, banjos, waltzes, good boys, games, clubs, sleeping, engineers, Tarzan, prayer, science, sports, farming, nurses, books, switchbacks, bankers, hotels, seaside.
- Test II Underlined 54.
 Circled:- Flirting, laziness, dullness, fibbing, talking-back, slang, blues, revolution, cad, spending, politics, outcast, cribbing, fighting, conceit, shabbiness, sham, foxtrotting, cheek, broker, cards, drinking, freak, tale-telling.
- Test III Underlined 56
 Circled:- Forgetfulness, sneer, clothes, worry, awkwardness, germs, tuberculosis, death, lightning, rivals, storms, popularity, helplessness, friends, athletics, clubs, marriage, drowning, ruin, impulse, neighbours, over-eating, disposition, books, childishness.

Scholastic (Burt).

Test 1 Reading (Accuracy). Reading Age = 6 yrs.
 Spelling age = 6.5 yrs.

Letters of the alphabet:- Called G first O, then K.
 " Q first O, then G.
 " Z first S

Clarence does not know the sounds of the letters, and he cannot say the alphabet. There seems to be a distinct reading defect due to his ignorance of the letters of the alphabet and their sounds.

Test 4. "Get me a pen" read as "Can me a peg".
 Test 6. Spelling.
 Bat (bad); pin (pen); cle (cap); go (got); to-doi (to-day);
 ther (this); tens (table); evd (even); bilk (Black);
 oli (only); ckaing (coming); corro (sorry); don (done);
 lsen (lesson); somok (smoke).

Attends Special M.D. school. Rt. handed. Normal birth.

TEACHER'S REPORT

- (1) Average age of class11 years
- (2) Position in classInapplicable
- (3) General quality of workPoor
- (4) General attitude to work.....Careless
- (5) Does he show any desire to be
near the top of his classInapplicable
- (6) Is he nervous in class?No
- (7) Is he willing to answer questions ..Yes
- (8) Does he read or recite in class, ...Slow at reading.
or is he merely passed over? Recitation good.
- (9) Does his work show any specific
defects - e.g., very poor
spelling, poor arithmetic, etc. ...Backward in all subje cts
- (10) Is he punished frequently? No
- (11) Does he always stammer? Yes
- (12) What are his relations with
other children?Aggressive.
- (13) Is he a leader in play?No
- (14) Is he frequently absent from
school?No - attend. for current
session, 348/352
- (15)

The father of this boy is said to be a "stammerer".

Case 8.

Age 8 yrs. 7 mths.

P. or G. Both alive (see below).

B. Two- aged, A 25 (married), Thomas 18.

S. Five, A 28 (married), B ? C 22, D 20, E 13.

Q. No.

W. About 1 year.

I. Whooping-cough, measles, not operated for Adenoids and tonsils. Doctor has suggested that this should be done.

Problem. STUTTERING.

FAMILY HISTORY. The following information was supplied by sister.:

The father, who is an engineer's labourer, has had chronic bronchitis for years and sleeps badly at night. The mother, who was unable to bring Peter to the Clinic, has always had poor health, is anaemic and has been under treatment by Professor Fraser. The sister knows of no members of the family who are left-handed. Both the older brothers still stutter - John who is married, sometimes very badly and Thomas a little. A sister of the mother's used to stutter, but the speech disorder has now disappeared. The mother is very nervous and given to worrying.

PERSONAL HISTORY. So far as this information goes there does not appear to have been any notable trouble over Peter's birth, but the mother's health has always been bad. Peter's appetite is variable. He does not eat much; sometimes objects to milk puddings. He still bites his nails badly. He gives no trouble over enuresis. Peter is sometimes very nervous about school. He seems to be all right when he is in regular attendance, but he does not want to go back when he has been absent. He appears to be backward in reading and to be worried about it. The sister thinks he is afraid of his present teacher, who appears to employ frequent threats that he should be kept in. He is liable to come home crying at mid-day. When he has been so threatened by the teacher, his mother keeps him at home, whether too readily or not did not appear. The nervousness with/

with regard to school seems to have been increased lately. The stuttering is intermittent, but he is quite talkative at home. Sometimes, however, the speech disorder becomes very bad, especially when he is in the least excited. He is easily disciplined and never punished. The sister thinks him generally orderly. He plays a lot with other children, and seems to get on well with them. The sister says "he is never in". The only trouble seems to arise when bigger boys hit him, then he is frightened and comes home. He has been talking recently in his sleep about his playmates and their games, e.g. cow-boys and Indians. He is very nervous of scolding at home - this, his sister thinks, being caused by the school situation. No contributing factors in the form of accidents or frights appeared.

INTERVIEW WITH PETER:-

Peter is a small boy, in appearance under-nourished and in attitude timorous rather than shy. Throughout the interview he wore a tearful expression, until in the end, when he was taken back to his sister, he broke down and wept just before leaving the Clinic for home. According to his sister, this result was just like that produced by the school situation, because, as she said, "he is never out of our sight". Peter himself says that he likes school and his teacher, but he is afraid of being punished with the strap. He is best at sums and "likes the teacher to tell a story". He plays in the evenings in King's Park.

During conversation and reading his speech was generally poor, but revealed none of the typical phenomena of stuttering. Throughout, however, his speech appeared breathless and very husky and showed some other defects of voice and articulation, the most persistent being his tendency to drop aspirates, - e.g. (h)at and (h)ave. He did not stutter in reading either isolated words (Burt's Graded Vocabulary), nor in reading continuous material. During the intelligence Test (Stanford Revision, Dr. Westburgh), he showed no confidence at all, but was shy, sensitive to failure and easily discouraged.

PSYCHOLOGICAL EXAMINATION

Intelligence .

Chronological Age = 8 yrs. 7 mths.
Stanford Revision of the Binet-Simon Tests.

M.A. = 7 yrs. 3 mths. I.Q. = 84.4

Dynamometer

R. 11 8 6.5

L. 9 7 7

Ball - R. String - R. Scissors R. Folding R.

Case 9

Age. 10 years.

B. or G. Both alive and well.

B. None

S. None

Q. No.

W. About 13 months

T. Early.

I. Mumps, measles, bronchitis once, chickenpox;
operated for adenoids and tonsils. General health good.Problem STUTTERING

FAMILY HISTORY. The following information was supplied by the mother, who is an intelligent, well - and rather slow-spoken woman. There are no other children in the family, but there was one other baby, a girl, before William was born, who died at birth.

The only other stuttering in the family is recorded in the case of William's paternal grandfather. No other members of the family are left-handed.

PERSONAL HISTORY: Birth in William's case was instrumental and very difficult. He was a large baby, (10½ lbs at birth). He had a healthy infancy. The mother was unable to nurse him, so that he was a bottle baby from the outset. He never objected to or refused the bottle/

bottle and was not a greedy feeder. He did not cry much, but his mother describes him as a "sleepless baby". He never slept for more than a few minutes at a time. His appetite now seems to be reasonably good. The mother knows of no marked likes or dislikes for different foods, but he would rather eat at night than at breakfast in the morning. A comforter was never used. He never had to be prevented from thumb-sucking. He does not bite his nails. There has been no prolonged enuresis and he was early trained in control of the bowel and bladder functions without much difficulty either way.

William "used to have a burr". In view of the fact that it appears still in conversation with William (see below), it is interesting to note that his mother says that it is now gone. William is definitely left-handed and always has been. At school and elsewhere he used his left hand in writing and drawing, but as the result of home training he is right-handed at table. The mother, who now speaks clearly and very deliberately, says that she too used to have a burr as a girl. William likes school and appears to do well. His mother does not know that he worries at all, but he sometimes does work at home that he does not need to do.

At home he talks freely, the stuttering appearing chiefly when he is excited. The speech disorder does not appear now to give him great trouble at school. He has never been much punished at home and never for his speech. The mother has made some attempt to stop him during stuttering attacks, in order that he might take more time. He is fairly orderly at home. He goes out to play a great deal ("never in"). He used not to hold his own well with other children, but has now lost his timidity. As he is a big boy for his age, however, the children with whom he plays are probably, in many cases, smaller if not younger than he is himself. He is not now afraid of the dark though he used to be so, and there has been no trouble over dreams or nightmares.

The stuttering started when he was between four and five years old. He went to school at five. According to his mother, "he has never had a clean nose since the adenoids and tonsils were done".

INTERVIEW WITH WILLIAM

William proved to be a large, rather solid boy, not unduly shy or nervous in appearance. His lips are full and prominent. He/

INTERVIEW WITH WILLIAM, cont.

He likes school and his teacher, does not appear to be strapped frequently and is top of the class or near it. After he passes the qualifying examination, he is to go to Leith Academy. He reads a great deal, and is particularly interested in engines, though he thinks, without much conviction, that he would like to be a sailor. He says that he is nervous when alone in the dark (e.g. going home from the pictures), and there appears to be some anxiety connected with school. He says that he is nervous when he has to speak in class and explains that he is afraid "he gets into a row." He introduced spontaneously as an illustration of his mental state the recent occasion when, having eaten his play piece in school, he was, to use his own word "nervous" because another boy said he would tell the teacher. He goes to the pictures twice a week and likes films dealing with engines, cow-boys and war. He says he dreams a good deal, but can remember none of his dreams. He displayed considerable pride of possession giving a long recital of his belongings. He has a great many toys at home and appears to have a strongly bent constructive use of them. His attitude, however, rather suggests that of a spoilt boy.

On this first visit William stuttered throughout the conversation. There was no marked diminution or increase as the conversation proceeded. The speech disorder was peculiar, but quite consistent in form. As well as stuttering, William displayed a pronounced burr. When required to speak he twists his mouth slightly to the right and the lips quiver involuntarily for some time before he can express himself. Vocalisation before he achieves a word or consonant may be quite prolonged in the form of a monotonous hum. Along with this, involuntary movements of the lips, teeth and tongue-tip precede various consonantal forms.

(B) The following examples indicate the nature and degree of the speech-disorder under the different conditions specified. In the reading of isolated words (Burt's Graded Vocabulary), the speech disorder was present throughout, although not on all words. e.g. j - j- j- j-m-autobiography; j-j-j-m-attic; t-t-t-sss-perpetual; d-d-d-holiday; ed-d-d-believe.

(C) In the reading of continuous material (Burt's Graded Vocabulary 1) he stutters in the same way between phrases, but not on every word. The speech disorder seemed to appear most frequently before "s", "h", "t", and "f", but it was by no/

no means confined to these letters.

(D) In reading along with the examiner (Milne's Teddy Bear) He reads quite well under these conditions.

(E) Left alone, he still stuttered although he said he had not.

(A) In response to questions:-

How old are you? Im-m-a-n- I was 10 years old j-j-j-on the
4th of April.

What school do you go to? T-t-t-t---Lochend Road School

Did you always have trouble
in speaking? D-d-d-d-not till my Grand-
father died.

Do you always do it now? D-d-d-d-when I get excited.

Are you excited now? Yes

Why? Because asking questions
makes me excited.

PSYCHOLOGICAL EXAMINATION

Intelligence

Stanford Revision.

M.A. = 11 yrs. I.Q. = 110

Burt's Graded Vocabulary.

Reading Age = 12.9 E.Q. = 115.9

Dynamometer

R.	18	24	21
L.	22	22	24

Scissors L. Folding L. String L. Ball L.

Scholastic/

Scholastic :-

Spelling (Burt's Graded Vocabulary Test 6).

Score = 70. E. A. = 12.0 E. Q. = 109.

Character & Temperament.

Pressey X-O Test.

Test I Under lined 47.

Circled:- Cinemas, camping, Napoleon, athletic girls, walking, reading, acrobats, banjos, jazz, handsome boys, clothes, games, pageants, ice-cream, typewriting, engineers, Tarzan, church, drawing, sailors, farming, soldiers, books, switchbacks, professors, country, fishing.

Test II Underlined 52

Circled:- Spitting, laziness, ignorance, recklessness, talking-back, slang, bluff, kidnapping, slowness, fault-finding, swearing, stupidity, fighting, grumbling, slyness, cunning, greediness, stealing, strike, bullying, gossip, drinking, dirtiness, tale-telling.

Test III Underlined 20

Circled:- Sickness, money, nervousness, death, homeliness, suffocating, poison, jealousy, food, drowning, ruin, burglars, twitching, dirt, knives, stammering.

Case 10.

Age 10 yrs. 2 mths.

P. or G. Parents both alive and well.

B. Three (A) 14 yrs. (B) 11 yrs. (C) 4 mths.

S. Two (A) 14 yrs. (B) 11 yrs. 11 mths.

W. 11 months

T. Early.

Class. Sen. 1B Q.NO

/

L. Measles, whooping-cough before going to school; ringworm; not operated for adenoids and tonsils; is not subject to colds. General health good.

Problemer. STUTTERING

The following information was supplied by the mother +

FAMILY HISTORY:- The father is a miner. The mother knows of no other members of the family who have shown any tendency to stuttering. One aunt of Michael's, a sister of his mother is left-handed.

PERSONAL HISTORY. Michael had a normal and natural birth, the mother being in good health at the time. He was breast-fed for about ten or twelve months and weaned quite suddenly. At no time did he give any trouble over feeding. He was not greedy and he did not cry much at any time. He now has a healthy appetite, has no stomach troubles and likes everything he is given in the way of food. At no time was a comforter used. There is no evidence of thumb-sucking nor of nail-biting, and at no time after infancy did he show any tendency to put things in his mouth. There has been no trouble over enuresis. He was easily trained from the outset, and there is no history of voluntary retention of the bowel motions. There is no evidence of any other speech disorder in Michael's own early speech or in the speech of any other member of the family.

He went to school at the age of five and liked it from the beginning. He has always been on good terms with his teachers and does not appear to worry about school.

At home he talks freely and is easily disciplined. He has never been punished much, the mother thinking that this would not be the best form of treatment for a stuttering boy.

The sister immediately older than Michael and not Michael himself is the most aggressive member of the family. He likes to play with other children and does not seem to be timid. After an early accident (see below), he had frequent nightmares, but for years now there has been no trouble of this kind. Michael used to be afraid of the dark, but is not so now and always goes to bed without a light. At the age of four and a half/

half, Michael was run over by a motor car at Newcraighall and sustained a fractured skull and a broken leg. He made a good recovery from the accident, but the stuttering started immediately after. Before the accident there had been no indication of any disorder of speech. No other trouble has resulted from the accident and the mother was advised at the Royal Infirmary that the speech disorder would pass away through time. It has, however, remained varying considerably in degree from time to time. The mother has noticed that Michael seems to stutter very much less during the school holidays. Although there is no suggestion that Michael is generally nervous, the mother says that when he is checked for doing wrong at home he flushes at once "gets worked up", and stutters badly.

INTERVIEW WITH MICHAEL

Michael is a big, healthy-looking, fresh-complexioned boy. There is no marked thickening or prominence of the lips. There was a distinct tremor in both hands during the interview. Michael himself says that this is always present.

At the beginning of the interview Michael always stood to begin an answer to a question and indeed continued to do so, as well as to interpolate "please sir", with great frequency until he was told not to. He says that he does not always like to go to school, an attitude which appears to be in the main conditioned by trouble about speaking in class. So far as scholastic achievement is concerned, he says that he is about the middle of the class.

Michael has a broad, Scots speech and a good strong voice. During spontaneous conversation he was incessantly scratching and clutching at his seat. His attitude during the interview and the various tests was very co-operative, although obviously nervous. The disorder of speech diminished quite considerably during the interview. In the reading of isolated words (Burt's Graded Vocabulary), to a point beyond his reading ability, he had little and nothing that could be described a stutter appeared. In reading continuous material, however, as also in ordinary conversation, although there was no stuttering over letters, there was throughout a very marked intermittent distortion of the breathing movements. Before speaking Michael gives a loud inspiratory gasp, the mouth being open wide. Similarly in reading there is a loud respiration interpolated like/

like a sob before phrases, at awkward places from the point of view of the sense. At such moments involuntary inspiration and expiration both appears to take place before he gains control of the speech mechanism. Left alone in the room and asked to continue reading, aloud, the speech disorder is still very marked.

PSYCHOLOGICAL EXAMINATION

Intelligence

Herring Revision.

Group A

M.A. = 10 yrs.

I.Q. = 98.5

Groups A & B

M.A. = 9 yrs. 10 mths

I.Q. = 97.

Scholastic

Reading (Burt's Graded Vocabulary)

Reading Age = 10.3

E. Q. = 104

Dynamometer

R. 25 4 23

L. 22 21 22

Ball R. String R. Folding R. Scissors R.

Case 11.

Case 11.

Age. 9 yrs. 3 mths.

P. or G. Both alive and well. Father a railway porter.

B. Two (A) 11 yrs. 9 mths. (B) 4 yrs. 11 mths.

S. None. Class. Jun. 2A Q. (No)

W. About 12 months.

T. About 12 months.

I. Measles about age 3; pneumonia at age 4; scarlet fever at 8; Not operated for adenoids and tonsils; not subject to colds. General health, good.

Problem. STUTTERING.

The following information was supplied by the mother.:

FAMILY HISTORY. The mother herself is left-handed, the only one of a family of 13 who is. She has a brother who stuttered at school, but the speech disorder has now disappeared. So far as she remembers he recovered rapidly after leaving school. The mother, who is a rapid vivacious speaker, thinks that she stutters slightly herself when excited.

PERSONAL HISTORY. Robert had a good and natural birth, the mother being in very good health at the time. He was a healthy baby, about 8 lbs. in weight. He was breast-fed for about 10 months and was weaned gradually. At no time was he bottle-fed. Weaning gave no trouble. His appetite now is healthy and he likes all the food that he is offered. The mother never used a comforter, Robert not being an irritable baby. There is no evidence of prolonged thumb-sucking and there has been no nail-biting. He was easily trained to cleanly habits and there has been no enuresis since infancy. He had no speech difficulty at first. The mother is very positive that the stuttering first appeared after the pneumonia at the age of 4. She thinks he had pleurisy at the same time, but the illness was lingering rather than acute. He was ill from November to January and the illness left him in a very debilitated condition. The stuttering seems to have begun before (but if so, just before) Robert went to school. Robert has never been left-handed. From the beginning he has liked school. He has had little absence and so far as the mother can tell does his lessons at home but is not over-conscientious. No notable trouble has ever arisen at school. Robert has always been on good terms with his teachers.

At home he is very talkative always, but easily disciplined and never strapped. He is not very aggressive and is learning orderly habits, but is not by nature excessively orderly. He goes out to play a great deal. He is not shy, but neither is he/

he forward or quarreelsome. The mother says that he is "a find nature", that the older boy is more difficult and more inclined to be aggressive. He has never given the rest of the family any trouble over his dreams or nightmares. He sleeps with his older brother. He sleeps well, usually from about 9 p.m. and gets up readily in the morning before the other boys. He is usually in the house by 8 o'clock. He is not afraid of the dark and goes to bed without a light. The mother thinks him a very even-tempered boy and not excitable except when a boyish quarrel arises. No causative or contributing factors in the form of accidents or frights were traceable.

Robert goes for messages without a note. If any difference between school time and holidays is traceable, the mother thinks that his speech is better during the former. He stutters most just after he comes home from school, if he attempts to recount the doings of the day. Asked to take time, he can repeat his story without stuttering.

INTERVIEW WITH ROBERT:

His lips are somewhat prominent. Robert proved to be a bright, pleasant and co-operative small boy, willing to talk despite the persistent stuttering and the collection of different speech defects which appear even in one short sentence. During the course of the interview his speech showed neither improvement nor deterioration. He seems to like school and to get on well there, saying that he is near the top of the class for sums and good at writing. Undesirable reactions are not discoverable to any part of his environment. Of his father and mother he says that he "likes the t-two of them". He says of his own stuttering that it is least troublesome at home and worst when he is with other boys. He does not, however, complain of their teasing him. (As these two questions were asked at widely separate moments in the conversation, the answers are corroborative).

In conversation and in reading under different conditions the stuttering, though always present, was not more marked than the obvious defects of articulation. The following defects appeared. He seldom pronounces "s" in combination with another consonant correctly, his substitutions being e.g., for "st" "t" or "cr" for "sp" and "p". Some of the substitutions resemble the malarticulations of infancy, e.g. "t" for "c", "p" for "b", "d" for "g", and "i" for "th". Along with the defect of/

of articulation there is frequent distortion of the vowel sounds, e.g. tillyphone. Examples of the stuttering and the other defects are as follows:-

- When is your birthday? I-I-I d-d-don't know.
 Where do you live? f-f-f-Not St Jamesick Street
 (= North St James St.)
- What is the name of
 your teacher? M-m-m-m-Miss Stcephard.
- What sort of things do
 you do at school? D-d-d-d-do sums; r-r-rh-atechism;
 'pellin'; j-j-j-rtheadin';
- When is your stuttering
 worst? "W-w-when I'm oo-oo-oot playin'
 in the creet. Cf. with this
 "along Princey Creet" (= along
 Princes Street).

The following examples appeared in the reading of isolated words. Ball became pell; even became er-er-j-j-j-even; Holidays became hol-j-j-holidays; inky became er-er-inky; kill became k-k-k-kill; open became o-d-n-open; pull became e-pu-pu-pull; road became roat;¹ yellow became y-y-yellow; very became v-pery² just became chut; water became w-w-w-w-o water; village became v-v-v-p-village; beward became p-p-peware. shelves became sssselves (? lateral lisp); covered became tovered; three became free; got became dot; raining became taining;

1 Explosive

- 2 The lips and teeth took up the correct position for "v", lost it before speech was achieved, and then the lips came together again to give explosive "p".

Exactly similar phenomena appeared in the reading of continuous material. Stuttering, therefore, appeared in all situations, except concerted reading, to some degree - namely reading alone and in the presence of the examiner, isolated words or continuous material and slightly even when left completely alone. The stuttering did not appear to increase markedly as the words became more difficult.
 Labial/

Labial stop positions were always strongly emphasised.

PSYCHOLOGICAL EXAMINATION

Intelligence

Chronological Age = 9 yrs. 3 mths.

Herring Revision.

Group A	M.A. = 8 yrs. 4 mths.	I.Q. = 90) I.Q. = 87
Groups A & B	M.A. = 7 yrs. 9 mths.	I.Q. = 84	

Scholastic

Reading (Burt's Graded Vocabulary) : Unsatisfactory;
impossible to score because of the speech-effects.

Dynamometer

R.	17	15	13
L.	15	13	11

Writes R. Ball R. Scissors R. Folding R. String R.

Character & Temperament

Pressey X-O Test.

Test 1 Underlined 50
Circled :- Football, pretty girls,
reading, singing, good boys, clothes,
clubs, coffee, sleeping, church,
sailors, farming, soldiers, newspapers,
cards, bankers, racing.

Test 11 Underlined 61
Circled :- Begging, anger, meekness,
fibbing, talking-back, slang, bluff,
war, boldness, spending, gang, out-
cast, butting-in, fighting, grumb-
ling, slyness, cunning, dancing,
pitch and toss, lock-out, bullying,

over-eating, borrowing, bragging, tale-telling.

Test 111 Underlined 59
 Circled:- School, sin, sickness, worry, pain,
 germs, noise, weakness, enemies, police, falling,
 lessons, society, morals, smoking, marriage, drown-
 ing, gun, darkness, crying, over-eating, grave,
 books, roughness.

Scholastic

Spelling (Burt's Graded Vocabulary Test 6).

Score = 35 E.A. = 8.5 F.Q. = 106.2

MEDICAL REPORT

- (1) Height 51 ins. Weight67 lbs.
 (2) Circulatory System:
 Pulse Rate 80
- Any abnormality of
 Heart action
- (3) Respiratory System:
 Expansion of Chest
- Any deformity of chest
 and its nature
- (4) Nose, Throat and Mouth.
- Presence of enlarged
 Tonsils and Adenoids No
- Presence of Nasal
 obstruction Slight
- Any structural abnormality
 of palate ...Slightly gothic.
- Any structural abnormality
 of teeth (rickets etc.) many decayed.
- Any structural abnormality
 of throat No

MEDICAL REPORT, cont .

Prominence and thickness
of lips or otherwiseNo

(5) Nervous System:

State of Pupils:moderately contracted.

Re-action to lightYes

Presence of deafnessNo

TremorNo

Knee-jerksneither exaggerated nor
diminished.

(6) State of Skin:.....Dampness.

Case 12

Age. 10 yrs. 3 mths.

P. or G. Both alive and well.

B. Two; half-brothers (paternal) three; (maternal) one

S. Four; half-sisters, (paternal) 1; (maternal) two.

W. About 12 months.

T. Just after walking.

Class (Sen. 1A) Q. No.

I. Measles slight about 18 months; not subject to colds;
not operated for adenoids and tonsils; general health good.

Problem. STUTTERING

The following information was supplied by the mother.:

FAMILY HISTORY:

There are three families in the household, both the father and
mother/

mother having been married previously. By the first marriage of the father there are three boys and one girl. Two of the boys are married; the other lives at home. The girl is at work in England. By the mother's first marriage there are three children: two girls (aged 22 and 19), and one boy (aged 15). By the second marriage of both parents there are seven children: Betty (13) Ena (12.2/12), Kenneth (10.3/12) Douglas and Albert (twins 7.7/12), Gertie 5.8/12), Isa (4).

The father is a compositor and does not stutter. The only other stutterer of whom the mother knows in the family is Kenneth's older half-brother belonging to the first family of the father. He stutters very badly, and was nearly refused from Bellevue school because of the speech disorder. There is no left-handedness traceable in the family and no evidence of marked instability.

PERSONAL HISTORY Kenneth had a natural and not difficult birth. The mother had influenza at the time. He was a healthy baby, weighing 15 lbs. at birth. He was breast-fed for 12 months and at no time bottle-fed. He was gradually weaned and no trouble arose. From the start he was a good baby, giving no trouble over feeding or teething. His appetite is healthy and he refuses nothing. A comforter was never used. There has been no prolonged thumb-sucking and no nail-biting. He was easily trained to cleanly habits and there has been no enuresis since an early age. This last, however is very troublesome in the case of one of the twins, Douglas and Gertie. Kenneth had no trouble with his early speech, the stuttering not appearing until four years ago, i.e. not long after he had gone to school. The mother would trace the responsibility for the speech disorder to Kenneth's first teacher. Before that his speech had been very good, but a very clever cousin (nephew of the mother's) had been a short time previously under the same teacher, who continually drew adverse comparisons between Kenneth and the cousin. As a result Kenneth became nervous and excited about school, so that the mother tried to have his class changed. There has been no further trouble at school, also, however, that the commencement of Kenneth's stuttering coincided with the birth of the youngest child, Isa (now aged 4). At no time has he shown any other speech defect. The stuttering is at times very bad, especially when he is excited and when he is in the presence of strangers. He stutters at home if he is quarreling. Kenneth is not left-handed.

He/

He likes school now and does not appear to worry over work. He is fond of reading history at home. The mother describes Kenneth as rather babyish and very ready to cry when tormented by the other children.

At home he is easily disciplined, not often punished and generally rather orderly. He goes out to play quite normally and is not quarrelsome. He is described as being timid and nervous, "not good at standing up for himself", and disinclined to play with boys bigger than himself. More than frequently he plays with the smaller children. There has been no trouble over nightmares. He sleeps well and is not afraid of the dark. No causative factors other than those described above were traceable in this interview.

INTERVIEW WITH KENNETH. During the first conversation Kenneth did not appear to be unduly nervous. He says that he likes school, is fairly well up in his class and is very keen on history. His stuttering is always worst at school. He is nervous, but he seems to take his normal place in the reading and recitation work of the class. He is occasionally punished. He dreams, but would not say that he remembered any of his dreams. His speech tended to improve as the conversation went on. He was at some disadvantage during the interview owing to the fact that he has bad eye-sight and had forgotten his glasses. The stuttering does not appear on individual letters, but appears in a convulsive opening and shutting of the mouth before speech can begin, sometimes accompanied by an er-er-sound and frequent convulsive inspirations through the nose. He might open and close the mouth five or six times before speaking.

In reading isolated words (Burt's Graded Vocabulary), these phenomena were frequently in evidence, perhaps increasing slightly as the material became too difficult for him. Jaw movements may be interpolated at any point; e.g. this little pig -----had none. Rhythm is distorted and breath control is frequently lost. Along with the examiner he read quite well and displayed not a little self-satisfaction at the result. Left alone, he still had some little trouble, although it was much diminished. The spasmodic movements may appear even in the middle of a word; e.g. "there is a man com -----coming in with a girl in his arms". Frequently they appear before utterance as if in the attempt to make a start. At times the closing of the mouth appears to be voluntary.

Further study of Kenneth's speech in continuous reading (Burt's Comprehension 5) revealed a great deal of convulsive jaw movement before he could start to speak, with frequent asthmatic inspiration through the nose with snoring and snorting sounds during the pauses. His voice is very hoarse when he achieves speech.

In reading alone there was marked spasm and fluctuation of the diaphragm along with the movements of the jaw. The shallow inspiration through the nose is required to make up for wasted breath. These spasms almost disappear when one reads along with the boy. He shows no other movements of any kind, except that the lips are sometimes brought together as if in order to swallow.

PSYCHOLOGICAL EXAMINATION

Intelligence

Chronological Age = 10 yrs. 3 mths.

Herring Revision.

Group A M.A. = 9 yrs. 3 mths. I.Q. = 90

Groups A & B M.A. = 9 yrs. 10 mths. I.Q. = 96.

Burt's Graded Vocabulary.

Reading Age = 10 yrs. F. Q. = 105 .3

Dynamometer

R.	17	18	17
L.	17	17	20

Ball R. Scissors R. String R. Folding L.

Temperament & Character

Pressey X-O Test.

Test 1 Underlined 51
 Circled:- Boating, damping, talking, banjos, good boys, games, ice-cream, artists, church history, travelling, business-men, books, switchbacks, circuses, racing.

Test 11 Underlined 67.
 Circled:- Spitting, anger, ignorance,
 fibbing, boasting, slang, debt, kidnapping,
 meddling, thoughtlessness, gang, swearing,
 cribbing, fighting, prize-fight, slyness,
 cunning, greediness, stealing, bullying,
 over-eating, drinking, bragging, tale-telling

Test 111 Underlined 33
 Circled:- Loneliness, headache, sickness,
 accidents, disease, fire, noise, death,
 enemies, police, falling, lessons, night-
 mares, dragnin, gun, burglars, twitching,
 grave, stammering.

Scholastic

English (Burt's Northumberland).

Test 1	Score 36	R.A. 11.0
" 11	33	11.1
" 111	17	10.5
" 1V	14	11.5
" V	44	10.2

144

E.A. (English) = 10.7 E.Q. = 112.6

Spelling (Dictation: Burt's Continuous Graded Test 7).
 Score = 409 E.A. = 11.8 E.Q. = 124.2

MEDICAL REPORT

(Height).....53 $\frac{3}{4}$ ins. Weight71 $\frac{1}{2}$ lbs.

(2) Circulatory System
 Pulse Rate 84

Any Abnormality of
 Heart Action.....Sinus Ayrthmia.

(3) Respiratory System:
 Expansion of Chest 2 $\frac{3}{4}$ "

Any deformity of Chest
 and its nature

MEDICAL REPORT, cont.

Nose, Throat and Mouth:

Presence of enlarged
Tonsils or Adenoids Tonsils enlarged

Presence of Nasal
obstruction Adenoids. yes.

Any structural abnormality
of teeth (rickets etc.) No

Any structural abnormality
of palate Palate highly arched.

Any structural abnormality
of throat No

(5) Nervous System:

State of Pupils. Moderately dilated.

Re-action to light Yes

Presence of deafness No

Tremor No

Knee-jerks Exaggerated.

(6) State of Skin Dampness.

TEACHER'S REPORT

- (1) Average age of class 9-10 yrs.
- (2) Position in class 6th from foot
- (3) General quality of work poor
- (4) General attitude to work Careful
- (5) Does he show any desire to be
near the top of his class? No
- (6) Is he nervous in class? -
- (7) Is he willing to answer questions. Yes.
- (8) Does he read or recite in class, .. He reads and recites
- (9) Does his work show any specific .. with a good reader or
defects - e.g., very poor ... with the teacher.
spelling, poor arithmetic, etc? ... Very poor in arith.,
also in spelling which

TEACHER'S REPORT, cont.

- (9) cont. which is carefully prepared, errors mostly in transposition of letters, e.g. "gril" for "girl". Good at history and geography.
- (10) Is he punished frequently?.... No, well-behaved boy.
- (11) Does he always stammer? Yes, except at roll-call
- (12) What are his relations with other children?..... Is a favourite and is not shy.
- (13) Is he a leader in play? No
- (14) Is he frequently absent from school?.....No

He is inclined to form his letters and figures backwards, otherwise is neat in his writing, drawing and handwork.

Case 13.

Age. 9 yrs. 4 mths.

P. or G. Both alive and well, father an electrician.

B. None.

S. Three. (A) 17; (B) 8; (C) 6.

Class. Jun. 2A. Q. (No).

I. Measles; not operated for adenoids and tonsils; general health good.

Problem. STUTTERING.

The following information was supplied by the father.

FAMILY HISTORY. The father, who brought David to the Clinic on the first occasion, is rather an intelligent, almost over-polite man, with considerable insight into the child's development and a sane objective attitude to his upbringing.

There is no left-handedness traceable anywhere in the family. The mother still stutters, chiefly when excited - this speech disorder being traced, according to the father, to a fright and pneumonia in childhood. David's eldest sister also used to stutter/

stutter, but seldom does so now even when she is excited. She still does so a little before strangers. She stuttered while she was at school, but has grown steadily better since she left at the age of 14. There is no stuttering in other members of the family and no other speech defect. The father says that his wife's health is good, but she is very nervous, highly-strung and given to worrying. If she gets into such a condition, the stuttering becomes worse.

PERSONAL HISTORY

David was breast-fed and never bottle-fed. He now has a healthy appetite and objects to nothing except onions. A comforter was used to quiet him in infancy. He has not had to be prevented from thumb-sucking, but still has to be frequently checked for chewing the end of a lead pencil. He does not bite his nails, but the mother does. There is still considerable trouble over nocturnal enuresis, which occurs two or three times a week. He has never been punished for this, but the father has himself talked to him about it. He has thought that it might be due to fear of the dark. There is no enuresis by day, but nocturnal enuresis appears to occur in the morning shortly before waking. He is never wet at night when the parents go to bed.

Advice was given them that David should be wakened and given an opportunity to pass water when the mother gets up, which she does at 6 a.m. David has a "robust constitution" and walks for long distances through the town. He has never been left-handed.

He likes school and went willingly at first at the age of four, being sent then "to get him out of the way". He was transferred last term from South Bridge School to North Canongate where he is at present. The father, on the basis of what David himself has said, thinks that he does not now stutter in school, but he did so badly about a year ago. He does not appear to worry about school and seems to have no home lessons. At South Bridge "he got the dux medal so often that he threw it away". The father has heard from other children that the teacher asks him to look after the class when she has to leave the room. David's speech was at first quite good/

good and the father traces the speech difficulty to the way in which the children were taught to read. His only reason for doing so is that the speech disorder manifested itself first while David was learning the alphabet., i.e. between four and five. He gives no trouble at home and is never punished. He can talk a great deal without stuttering. He is allowed to go to the pictures twice a week and he can tell the story on his return without trouble. He goes out to play a great deal, consorting frequently with boys far older than himself, so that the father has taken steps to control his company. He thinks that David is a little nervous, "he gets into a state if he is threatened". There have been no nightmares, but he is afraid of the dark and "needs a glimmer of light until he falls asleep". He sleeps well and rises early. When he was just six David fell off a lamp-post and cut his head badly - an occurrence which is rather indicative of the nature of his activities than important for its influence on the speech disorder.

INTERVIEW WITH DAVID

It should be noted that the father had shown David the Education Committee's letter of recommendation to the Clinic, his reaction being "I don't stutter", with the implication that he did not need to go.

During conversation David was shy and a little suspicious. He tended to make his answers as short as possible and would respond "no", rather than tell the truth if the latter would require a longer speech. Everything points to his being an energetic, probably rather aggressive youngster, and to a life of incessant activity. He describes how he makes money in order to go to the pictures by selling fire-wood on Saturday mornings. He and the other boys whom he knows get the boxes for nothing, break them up and do a brisk trade.

He knits his brows and frowns during speech. He goes to the University Settlement Boys' Club every Monday and Friday for games and boxing. He likes school, but does not like North Canongate as well as he did South Bridge "because you get the strap if you have sums wrong". The stuttering appears either/

either as a repetition of the initial letter of a word, over-emphasis of consonants in the stop positions or, most frequently, the interpolation or even substitution of an aspirate. This last seems to be a result of defective breath control and has the impression of involuntary expiration. His speech is a peculiar mixture of slovenly Edinburgh characteristics with the vowel sounds of an English dialect.

Stuttering appeared throughout spontaneous conversation. It was not marked in the reading of isolated words (Burt's Graded Vocabulary), although considerable effort was required to prevent it, nor was there much actual stuttering in the reading of continuous material, and the characteristics of the reading were the same whether the examiner was present or not. He reads very rapidly, much more rapidly than he speaks, breathily and breathlessly.

Examples of his speech under different conditions are as follows:-

(a) in response to questions.

What is your name? D-d-d-d-david.

How old are you? Hhhine

When is your birthday? Hon December.

What school do you go to? Er-er-er-no-o-o-arth Canongate
(N.B. the vowel distortion in noarth appears to be one of the manifestations of the speech disorder).

Who is your teacher? Miss Pat-----erson.

Which class are you in? J-junior t-t-two A.

How many sisters have you? Two sisters, whhhone is 7 and other's 5 and a biieg one. She's gaun for eighteen (over-emphasis)

He likes best " c-c-cow-boy p-p-pictures and mmmmmhurder pictures". At school he likes s-s-s-husms. He goes to the Settlement "every Monday and Friday" (Cf. also Mr. Rociddel).

PSYCHOLOGICAL EXAMINATIONIntelligence

Chronological Age = 9 yrs. 4 mths.

Burt's Graded Vocabulary.

Reading = about 9.2

Herring Revision.

Group A M.A. = 9 yrs. 7 mths. I.Q. = 103
 Groups A.& B.M.A. = 9 yrs. 1 mth. I.Q. = 98

PHYSICAL EXAMINATION

Nothing special to note.

Knee-jerks slightly exaggerated.

Long prepuce.

Tonsils have not been removed. No evidence of adenoids.

MEDICAL EXAMINATION

- (1) Height51 ins. Weight65½ lbs.
 (2) Circulatory System:
 Pulse Rate68

Any abnormality of
 Heart Action No

- (3) Respiratory System:
 Expansion of Chest 2".

Any deformity of Chest
 and its natureNo

- (4) Nose, Throat and Mouth:
 Presence of enlarged
 tonsils or adenoidsMarked

- (5) Presence of Nasal
 obstruction deviation

Any structural abnormality
of teeth (rickets etc.)No

Any structural abnormality
of palateNo

Any structural abnormality
of throatNo

Prominence and thickness
of lips or otherwiseNo

Nervous System:

State of Pupils:.....Moderately dilated.

Re-action to light..... Yes

Presence of deafness..... No

Tremor No

Knee-jerks Slightly exaggerated.

State of skin: Slight dampness.

TEACHER'S REPORT

- (1) Average age of class... 9 yrs.
 (2) Position in class.....Among the first six.
 (3) General quality of work.....Very good
 (4) General attitude to work.....Careful
 (5) Does he show any desire to
be near the top of his class? .Yes
 (6) Is he nervous in class?.....Was nervous but not now.
 (7) Is he willing to answer questions. ...Yes
 (8) Does he read or recite in class,
or is he merely passed over? Reads well
 (9) Does his work show any specific
defects - e.g., very poor spelling,
poor arithmetic, etc? . No
 (10) Is he punished frequently? No
 (11) Does he always stammer? I have noted
in my third exam. where he had
3 out of 4 marks.
Stammer now gone almost.
 (12) What are his relations
with other children?Confident.
 (13) Is he a leader in play? Yes
 (14) Is he frequently absent
from school? Not often absent
 This lad has improved greatly since coming here in Sept. 1931
 He had a bad stammer but this has almost gone.

Age. 8 yrs. 1 mth.

B. or G. Both alive and well.

B. One, aged 11

S. Four, aged (A) 9 yrs. (B) 6 yrs. (c) 4 yrs. 11 mths.
(D) 3 yrs.

W. Late. Over 2 yrs. before she
walked properly: rickets.

T. Before 18 mths.

I. Bronchial pneumonia at 8 mths. chickenpox during infancy; measles first year; whooping-cough at 3 yrs.; scarlet fever at 3 yrs.

Problem. STUTTERING.

The following information was supplied by the mother:-

FAMILY HISTORY . Home conditions in this case are and have been for a long time economically very difficult. The father has been unemployed continuously for six years and the family, consisting of father and mother and six children are at present living on an unemployment allowance of 35/3 per week; of which 7/8 goes for rent. The mother's health is not at present very good. She has frequent sore throats. Elizabeth's general health is said now to be good. For some time at an earlier stage she suffered from swollen glands and discharging ears following upon scarlet fever. She still has earache and complains of its hurting her when her ears are washed. There is no evidence of stuttering in any other members of the family, nor is there any left-handedness. The mother, despite the difficulty of home conditions, did not appear to be unduly nervous and certainly not excitable. She is making a considerable effort in the face of adverse circumstances and Elizabeth, when she came to the Clinic was well-dressed and clean.

PERSONAL HISTORY. Elizabeth's birth was natural and not difficult, but she was the smallest baby in the family - only 6 lbs at birth. During infancy she was very quiet and never cried. According to the mother, she "took a kind of dwining when the next baby came". The mother showed considerable insight into the reasons for this. Elizabeth was fed on breast and bottle together until she was 8 months old, when she went to hospital so that there was enforced weaning. At first she did not thrive well. She now has a good appetite, but does not like milk puddings, nor sweet things. In general/

general she likes salt and sour things. At present she has the dinner which is provided at school. Her digestion is generally good. The mother used a comforter for over a year in Elizabeth's case. There has been no trouble over thumb-sucking and none over nail-biting. She was early trained to cleanly habits has shown no tendency to constipation, seldom has medicine and there is no enuresis; although it is still bad in her younger sister.

At the beginning her speech was good. The stuttering has appeared slowly after scarlet fever when Elizabeth was about three years old. It has grown steadily worse since she went to school and is now very bad. She shakes and twists her head when she is speaking and it is painful to watch her when she is excited. She has never been left-handed. She likes school and went willingly at first. Her reports so far as the mother remembers have been good and she has a sympathetic teacher. She is, however, a very nervous child, especially about school. She is teased by the other children and this always leaves her in a nervous condition. She is frightened to go for messages, because of the speech trouble.

At home she is orderly, smart and helpful about the house. Sometimes she speaks quite well, but for some time the speech disorder seems to have been getting worse. She has not been much punished and never for stuttering. She gets on well with her father and with her older brother. The mother says "she can bully her older sister".

The mother thinks that she is shy and says she is given to reading what is probably the only material available, namely comic papers. However, she goes out to play and indeed is "never in". She seems to adapt well to other children and is neither quarrelsome nor timid. She is not afraid of the dark, sleeps well and has no nightmares. She is very nervous when she gets into trouble and "goes white at once", even before a word of scolding is spoken. There is no evidence of contributing factors in the form of accident or shock. Her digestion is generally good.

INTERVIEW WITH ELIZABETH:

Conversation or examination of any kind was almost impossible on Elizabeth's first visit to the Clinic. She was in a highly nervous state and almost unable to speak at all. She/

She very nearly cried at first, but soon responded to encouragement. In her attempts to speak or read the phenomena described above by the mother were very marked.

Elizabeth was in a much more responsive attitude and a considerably easier frame of mind on her second visit to the Clinic. Despite the fact that she experienced considerable difficulty in her attempts at speech, but it was possible to administer a Stanford Revision Test. Her responses and general attitude hardly suggested so marked a degree of retardation as there appeared. The speech disorder appeared to some extent in all the situations in which it was possible to test her speaking. Repetitive stuttering on initial sounds did not appear at all, but there was extreme distortion of the respiratory movements during speech with spasmodic contortions and twitchings of the trunk and neck. Frequently during her attempts at speech her eyes almost started out of her head. The stuttering was present in the reading and repetition of isolated words, but became very much worse in free responses to questions. She had some difficulty in repeating words (as in Stanford VI 6) after examiner, but the stuttering practically disappeared in the repetition of numbers (as in Stanford VII 3).

PSYCHOLOGICAL EXAMINATION

Intelligence

Stanford Revision.

M.A. = 6 yrs. 6 mths.

I.Q. = 80.

TEACHER'S REPORT

- (1) Average age of class..... $7\frac{1}{2}$ yrs.
- (2) Position in class..... In lower half of class
- (3) General quality of work ... Poor
- (4) General attitude to work.... Careful
- (5) Does she show any desire to
be near the top of her class?.No
- (6) Is she nervous in class ?No
- (7) Is she willing to answer
questions?Yes
- (8) Does she read or recite
in class?.....She reads and recites
in class.

TEACHER'S REPORT

- (9) Does her work show any specific defects?..... No
- (10) Is she punished frequently?..... No
- (11) Does she always stammer?Yes. It is most evident when she is answering in class.
- (12) What are her relations with other children?Confident.
- (13) Is she a leader in play?No
- (14) Is she frequently absent from school?No

This child stammers very badly and seems to be getting worse.

Case 15.

Age 9 yrs. 9 mths.
 P. or G. Both alive and well
 B. None
 S. One aged 11 yrs. 5 mths.

W. 14 mths.

Sen. 1B Q. (NO).
 T. about 14 mths.

I. Pneumonia just after went to school; given to having head colds and nasal catarrh; nose frequently clogged; operated for tonsils a year ago; general health good.

Problem. STUTTERING

FAMILY HISTORY: Information supplied by the mother:
 The mother's father inclined to be left-handed. No other cases of stuttering are known of in the family. The mother says that she herself was four years old before she spoke properly, her speech being characterised by a lisp and tongue tie. She does not speak well yet, her speech and facial characteristics suggesting an excessively high palatal arch. Before the birth of the first child, the mother had good health, but since then has suffered from frequent nervous debility and nervous breakdowns. The father has neuritis and is perhaps nervous. The mother is obviously weak, but not unintelligent. She says that she worries, especially about the children. The girl/

girl has good health. She was a premature and difficult birth (7 months), trouble arising because the doctor neglected to come when sent for.

PERSONAL HISTORY

James had a natural and not difficult birth, but the mother herself was in bad health just before he was born - being in a nervous and debilitated condition. James was a normal healthy baby. He was breast-fed for three months and bottle-fed thereafter, because the mother was not strong enough to continue breast-feeding. He was weaned suddenly because, according to the doctor, the child was being starved on the breast. As a baby he was not troublesome. He has always had a good appetite and at no time has he given trouble over feeding. He refuses nothing in the way of food and eats a great deal. The mother attempted once to use a comforter, but the child refused it. It has not been necessary to prevent thumb-sucking. There is a slight tendency to bite his nails. He has been easily trained to cleanly habits and there is no history of enuresis or of voluntary retention of the bowel motions. He spoke well until he was four years old, when he had a severe fright, as the result of a frying pan blazing up. The child went white, shuddered and roared and for a short time was unable to say anything articulate. He has stutted ever since and the mother traces the trouble to this origin. The disorder varies considerably in degree. It is worst when he is excited and seems to be worse during the school terms than it is during the holidays. The teacher's attitude is sympathetic. Both the mother and father have tried to help him by means of some breathing and reading exercises which they have themselves devised. The attempt generally seems to have been a sensible one. The mother has found that he can read freely when any other person reads along with him.

He has never been left-handed. He likes school and went willingly at first. He does not appear to require to work hard. His mother helps him at home with his lessons if necessary, and his reports have been quite good. At one time he had a lady teacher who punished him a great deal and he cried at home about it.

At home he talks freely. He gets on well with his sister, who, according to the mother, is more aggressive than/

than he is. He is never punished at home and is very obedient, especially to his father. He is never indoors and gets on well with other children. He is shy and bashful with strangers and rather timid, as the mother is also to a considerable degree.

James is not a great reader. There has been no great trouble over nightmares or talking in his sleep. He sleeps well from 9 p.m. or 9.30 p.m. to 8 o'clock in the morning. He is a member of the Wolf Cubs and attends church choir three times a week.

His excitability appears most when he attempts to tell a story. He has never been afraid of the dark.

INTERVIEW WITH JAMES

His lips are very prominent and full. James's attitude on his first visit to the Clinic was very good, co-operative and highly humorous. Left alone he found the situation or the material highly amusing and laughed loudly to himself throughout. He did not appear to be unduly nervous and offered some spontaneous jokes. He talked freely and with animation about himself and his doings. He likes school and answers questions and reads in class. He likes drawing but not spelling, at which he is not very successful. He is not now afraid of the dark, though he used to be. He dreams "a-a-a-about Bobby and us a-a-a-along at Joppa rocks". In his dreams he sees what he has just been doing during the day. He goes fishing at Joppa and describes this vivaciously. He keeps the fish in a large bowl and has constructed a rather elaborate rocky bottom. He keeps a pair of lovebirds and appears to be fond of animals. His father is a railway joiner and James "would like to be a train driver".

Stuttering appears in repetitive form on vowels and stop consonants during conversation and reading. He reads in a loud, clear voice. The speech disorder appears in the reading of isolated words, e.g. Burt's Graded Vocabulary. For example, "his", "sad", "su", all usually prolonged expiration on the initial consonant; "put", "girl", "carry", "village", "nurse", "return", "terror", all usually repetitive stuttering on the initial consonant. The speech disorder affected the letters "a", "b", "d", hard "g", "f", "k", "l", "m", "p", "s", "w", at least.

reading continuous material (Five little Pigs), well within/

within his capacity, he stuttered only once.

In reading along with the examiner, stuttering disappeared ; but left entirely alone, the speech disorder was present to a slight extent.

Examples obtained during the Herring Intelligence Test.

- (a) I see a young woman sitting and a young woman upright
 (b) She is telephoning to a young man (here James laughed) and she is emptying something out with anxiation

There was prolonged expiration on all the sibilants and repetitive stuttering on the other letters underlined.

PSYCHOLOGICAL EXAMINATION

Intelligence

Chronological Age = 9 yrs. 9 mths.

Herring Revision.

Group A	M.A. = 8 yrs. 4 mths.	I.Q. = 85
Groups A & B	M.A. = 8 yrs. 9 mths	I.Q. = 90

N.B. See interview with James for responses.

Response to Test 3 "Thought". "It's a river, and there's a flood and a lady gets drowned and she gets pulled out again"

Dynamometer

R	18.5	14.5	15
L.	15	13.5	13

Ball R. String R. Folding R. Scissors R.

Scholastic

Spelling (Burt's Graded Vocabulary Test 6)
 Score = 35 E.A. = 7.5 E.Q. = 88.2

Character & Temperament

Pressey X-O Test.

Test 1. Underlined 13

Circled:- Boating, football, hymns, ice-cream, children, housekeeping, teachers, racing.

Character & Temperament, cont.

- Test 11. Underlined 19
Circled:- Spitting, ignorance, fibbing, boasting, war, divorce, swearing, disgrace, betting, slyness, cunning, greediness.
- Test 111. Underlined 8
Circled:- Money, fire, habits, lightning, storms, lessons, dreams, jokes.

MEDICAL REPORT

- (1) Height52 ins. Weight66lbs.
- (2) Circulatory System:
Pulse Rate80
- Any abnormality of
Heart ActionNo
- (3) Respiratory System:
Expansion of Chest2 $\frac{3}{4}$ "
- Any deformity of
Chest and its natureNo
- (4) Nose, Throat and Mouth:
Presence of enlarged
Tonsils or Adenoidsremoved at 9 yrs.
- (5) No structural abnormality
of nose, teeth, palate.
throat.
- (6) Nervous System:
State of Pupils:moderately con-
tracted.
- Re-action to lightaverage
Presence of deafnessNo
TremorNo
Knee-jerksvery slightly exaggerated.
- State of skin. healthy

TEACHER'S REPORT

- (1) Average age of class9 yrs. 2 mths.
 (2) Position in class..... 34th (43 in class)
 (3) General quality of work..... Good
 (4) General attitude to work..... Careful.
 (5) Does he show any desire to
 be near the top of his class? ..Yes
 (6) Is he nervous in class?No
 (7) Is he willing to answer questions? Very willing
 (8) Does he read or recite in class?... Reads & recites
 (9) Does his work show any specific defects?. Very poor
 spelling.
- (10) Is he punished frequently? No
- (11) Does he always stammer?Does not stammer
 in playground, nor when working
 with whole class but stammers
 badly at reading.
- (12) What are relations with
 other children?Confident.
- (13) Is he a leader in play?.....No
- (14) Is he frequently absent from
 school?.....No

While reading invariably stammers at words beginning with
 "b" or "w". Oral work very much better than written work.

Case 16.

Age 10 yrs.

B.or G. Both alive and well.

B. Three - (A) 12, (B) 8 (C) 2½

S. Two (A) 5, (B) 8 weeks.

Class. Jun. 2A. Q. (No).

W. 11 months (rickets).

T. about 12 months.

I. Whooping cough at 2½; chickenpox about 3; measles
 about 4; operated for tonsils at 8; continuous
 nasal discharge.

PROBLEM. STUTTERING.

The information was supplied by the mother:-

FAMILY HISTORY /

FAMILY HISTORY. The father is a jeweller and has been unemployed since September. He was previously unemployed eight years ago for a period of three years, following the War. There is no evidence that other members of the family have ever stuttered, except some hearsay indication that the grandmother stuttered in childhood. Robert's younger brother, aged 8, was left-handed, but is not so now. There is no other evidence of left-handedness. There have been no other speech disorders in the family, except a slight lisping in the case of Robert's sister Helen, aged 5. She displays also some nervous tendency, which the mother fears may be choreic. The father has been nervous since the War. The mother is given to talking in her sleep and frequently gets up at night because of fright.

PERSONAL HISTORY. Robert has had choreic tendencies for several years and has just returned home a fortnight ago, after prolonged treatment for the chorea. After nine weeks in the Infirmary under Dr. Chalmers Watson, he has been nine weeks in the Children's Holiday Home at Stitchell.

Robert had a natural and not difficult birth, the mother being in good health at the time. He was a healthy baby, $6\frac{1}{2}$ lbs in weight at birth, but suffered from rickets. Robert was breast-fed for 11 or 12 months. At no time was he bottle-fed. He was weaned suddenly, but was not very troublesome. He cut his first teeth early, about 6 months, and was less than usually troublesome. He now eats everything that is provided and he is described by his mother "as a terrible eater". At no time was a comforter used with Robert. It has been unnecessary to take measures to prevent thumb-sucking or nail-biting. Enuresis stopped after infancy, but has begun again during the last year or so and now occurs once or twice a week at home. There was no trouble of this kind in the Infirmary and it occurred only once at Stitchell. At home he has been scolded but not punished. He has tea at 5 and nothing to drink thereafter before going to bed. At first there was no trouble with speech. He had begun to sing by the age of 9 months. Stuttering began when he went to school at the age of $4\frac{1}{2}$. He was on good terms with his first teacher, but from the beginning there has been trouble because Robert has always been backward. The speech disorder is sometimes better for a day or two, and is better during the school holidays than it is during terms. It is not very bad at home, but is worse with strangers. Along with the stuttering there are noticeable hand movements as well and a facial twitching when he is excited. These conditions last for a few days at a time ("chronic twitchings" noted at the Royal Infirmary).

Robert has never been left-handed. He likes school and does not appear to worry about it, but the teachers find him troublesome/

troublesome because of the involuntary twitching. His present teacher has called him a nuisance. Some sort of fainting turns appears to have occurred in the morning before he went to school, previous to his going to the Infirmary.

Sometimes he is talkative at home. In the matter of discipline he requires frequent telling and has a variable temper. He is not whipped. He seems to get on well with other children, sometimes fights with the boys and is inclined to be aggressive. He is not timid or shy. There has been no trouble over nightmares and he is not afraid of the dark. The mother describes him as a very excitable child, the excitement appearing after he has been playing energetic games like football, and especially after a quarrel with the other boys. He is a member of the Life Boys and sometimes goes to the pictures.

INTERVIEW WITH ROBERT. Robert did not appear to be unduly nervous during the initial interview, but neither was he very intelligently co-operative. Asked what class he was in he replied, "Miss-Miss McIntyre's". Asked what he liked best at school, he replied "I like u-best when you go to school to learn things". He could not remember anything about his dreams, but says that he is not afraid of the dark. He seems to take part in all the games of the other boys such as run-a-mile, hop-and-dig, football, hide-and-seek. He is a member of the 36th Life Boys in the Tolbooth Church, where his brother goes on the same evening to the Boys' Brigade. He says that his stuttering is sometimes troublesome in school and that he is punished now and then, "for not looking at the teacher". Robert shows a decided squint. His lips are not unduly thickened or prominent, but they are protruded in speaking. There is a defect of articulation on the letter "s", the tongue tip and the lower lip being brought into position to result in what is almost a lisp.

In spontaneous speech little stuttering appeared during this conversation. Similarly there was not much evidence of speech disorder in reading simple words (Burt's Graded Vocabulary), except e.g. "pot", "wet", "together", "beware", which all showed slight hesitant stuttering on the initial consonant, with some tendency to over-emphasise consonants in the stop positions.

Reading continuous material ("Five little Pigs"), he read very fast and breathlessly, stuttering taking the form chiefly of inopportune and involuntary hesitations. He reads himself out of breath and this is followed by a sucking inspiration which continually distorts the rhythm. The reading in itself was poor, but there was little or no stuttering. There was a continuous nasal sniffing.

In reading while alone the rapid reading and distortion of rhythm still persisted in some measure, although it appeared to be considerably diminished.

In reading along with the examiner he appeared to have difficulty in following the voice. So long as he succeeded in doing so the disorder was not apparent, but he tended to read ahead and then to hesitate as in the other tests.

PSYCHOLOGICAL EXAMINATION

Intelligence.

Chronological Age = 10 yrs.

Drever-Collins Performance Test.

Score = 65. M.A. = about 9 yrs. 2 mths. I.Q. = about 92.

Burt's Graded Vocabulary.

Reading Age = 8.6 yrs. E.Q. = 85.

Dynamometer

R. 14.5 14 15.5

L. 14.5 11.5 14

Ball R. String R. Folding R. Scissors R.

PHYSICAL EXAMINATION

Height = 4ft. 4 $\frac{3}{4}$ ins. Weight = 5 st. 1 lb.

Knee-jerks present on reinforcement only.

Ankle-jerks present, neither exaggerated nor diminished.

Plantar reflex not obtained.

Pupils moderately contracted. They are equal and react in light and accommodation.

Circulatory System:- First heart sound rather accentuated. Interval between first and second sounds somewhat prolonged. No thrill. No murmurs. Chest shows some signs of rickety deformation.

Tonsils have been removed (at age of 4). Nasal discharge from left nares. The boy has difficulty in breathing when the the mouth is closed and is a mouth breather. He coughs a great deal.

On the left ankle there is a sore of a carbuncular character. When asked how this sore came to exist, the boy said that he was always kicking his left ankle in walking.

MEDICAL EXAMINATION

- (1) Height $53\frac{3}{4}$ ins. Weight75 lbs.
 (2) Circulatory System:
 Pulse Rate 68
 Any abnormality of heart action No
- (3) Respiratory System:
 Expansion of Chest $2\frac{1}{2}$ "
 Any deformity of Chest and its nature No
- (4) Nose, Throat and Mouth:
 Presence of enlarged Tonsils or AdenoidsNo. (Ts & As removed)
 Presence of Nasal Obstruction.Dev. Left. Expstaxis frequent
 Any structural abnormality of teeth (rickets etc).No
 Any structural abnormality of palateNo
 Any structural abnormality of throatNo
 Prominence and thickness of lips or otherwise No
- (5) Nervous System:
 State of Pupils Moderately dilated.
 Re-action to light Brisk
 Presence of deafnessNo
 TremorNo
- Knee-jerks.....neither exaggerated nor diminished.
 State of skin.....Healthy.
-

TEACHER'S REPORT

- (1) Average age of class.....8.6
 (2) Position in classnear the foot
 (3) General quality of work Poor
 (4) General attitude to work Careless
 (5) Does he show any desire to be
 near the top of his class?..... No
 (6) Is he nervous in class?..... No
 (7) Is he willing to answer questions? Yes
 (8) Does he read or recite in class? Reads & Recites.
 (9) Does his work show any specific
 defects?.....Poor spelling, fair
 arithmetic.
 (10) Is he punished frequently?No
 (11) Does he always stammer?No
 (12) What are his relations
 with other children?Aggressive
 (13) Is he a leader in play?.....No
 (14) Is he frequently absent
 from school?Yes
 If so, why? Illhealth.

Has been at Stitcheil, Humbie, etc. for health reasons.

Case 17.

Age. 12 yrs. 4 mths.

P. or G. Both alive and well.

B. One. died when three days old in 1926.

S. Two. (A) Jean, 6 yrs. (B) Emma, 4 yrs.

Class. 1A Technical. Q. (Yes)

W. 15 months

T. late- 18-21 months.

I. Measles; whooping-cough; congestion of lungs; - all
 between 5 and 7. Chickenpox earlier: mumps at 6 weeks.
 Not operated for adenoids and tonsils: not subject to
 colds: general health good.

Problem. STUTTERING.

FAMILY HISTORY. Information supplied by mother.:

There is no evidence of left-handedness or stuttering in any
 other members of the family, nor is there other indication
 of instability.

PERSONAL HISTORY. James had a difficult, "cross" birth,
 the mother being in bad health and very worried and nervous
 over/

over the arrival of the first child. James was, however, a healthy baby, about 7 lbs. at birth and gave no trouble. For the first 10 months James was breast-fed, but weaning was begun about the age of 6 months, when the mother began to give him rusks. James was a greedy feeder with a large appetite, which was too large for his mother and this was the reason for his being partially weaned at an early stage. He has a healthy appetite now and likes everything that is provided in the way of food. A comforter was used until James was about 15 months old. He cut his first teeth easily. There has been no prolonged thumb-sucking, no nail-biting and no enuresis. From the beginning he was readily amenable to training in cleanly habits. James's early speech was good and the mother noticed nothing resembling stuttering until he was about 6 years old. It was remarked upon at school about the same time by James's teacher. It is possible that it may have been present previously but in a slight degree so it was unnoticed at home. For some time the speech disorder has shown some sign of improvement which the mother thinks has been more marked since he went to James Clark's School. James likes school and went willingly and by himself from the beginning. He has not been much punished nor threatened at school at any time. He had the same teacher throughout his time in the primary school. During his early school career, between 5 and 7, he was worried because he had to be kept back because of ill health, when his chums were promoted to other classes. He cried about this at the time. He has always worried over examinations and cried even over the recent Qualifying examination. The mother traces his over-conscientiousness with regard to school work to his first setback. His chief speech trouble at school seems to have arisen during the Bible lesson when recitation was demanded. Frequently James was able to repeat the lesson at home, but failed in school. The mother has interviewed the teacher and explained the situation, finding her sympathetic. He is never absent from school now, his general health being good. He has thrived better since he was seven.

James is very sensitive about other children laughing at him. He does not go out much but "has to be pushed out". At present he is a newsagent's messenger boy, going with papers in the morning (6.30 a.m.) and afternoons. He is "a great reader" and proud of any successes he has had. He was a member of the Wolf Cubs and would like to join the Boys' Brigade. /

Brigade. He has never been punished much at home, being at all times well-behaved and orderly. He is not obviously aggressive, and "is always sharing his things with the younger children". He displays a marked lack of confidence in himself, being, for example, afraid to join the Boys' Brigade because he thought he had to be able to swim. There is some indication that in this instance, and perhaps in others, the lack of confidence is produced by an over-anxious mother. He has no nightmares, but sometimes speaks in his sleep about football and games. He is not excitable and not afraid of the dark. He always goes to bed without a light and sleeps well. About the age of 6 he fell from a step-ladder and sustained a shock at the time, although there were no serious results. The mother, however, who was pregnant at the time, had a bad fright. The baby was born prematurely and died in three days.

INTERVIEW WITH JAMES. James wore a somewhat nervous and worried expression during the interview, but despite obvious timidity was quite communicative and willing to talk. He likes school in general and but for the speech trouble would do so always. This, he says, "goes awau and comes back". His chief difficulty occurs in the Bible lessons and in geometry, where he has to recite. He answers questions and reads in school. He finds some things easier than others in speaking; e.g. "the verses of the Bible with wee lines in it". The letters "c" and "f" are very troublesome.

He says that he liked Sciennes better than his present school and appears to be not yet settled down in his new environment. He went to James Clark's School, where he is following a technical course, after Christmas, 1931. At Sciennes he was generally near the top of the class. He says that he would like to be an electrical engineer.

In speaking he feels his lower lip involuntarily retracted. Pointing to it, he says, "that goes er-right in and er-I er-can't er-dtop it from going in". This does happen quite frequently during speech cramps. In spontaneous conversation, hesitations with cramping of the speech mechanisms were very frequent. At such times the cramping would come to an end with an interpolated "er" or "an", lightly touched, before the difficult word, the word being thus often expulsively uttered. During hesitation the lips are frequently rounded as if for "o" and the tongue raised and slightly protruded. The organs of articulation are in position for coughing. His speech displays also some laryngeal spasms. Apart from the stuttering there is a partial interdental lisp on "s" and "z" and general thickening of speech. In the words "three", "through" and "throat" "thr" becomes "chr". His speech is not rapid; the lip musculature appears to be somewhat inflexible/

inflexible, the mouth never being properly closed during speech. In the right upper jaw the canine and premolar teeth are badly displaced.

In reading isolated words (Burt's Graded Vocabulary), there was little or no trouble on simple, especially one-syllable, words. Interpolated "er" however appeared on nearly all words in the test from "shelves" onwards.

In reading continuous material (Burt's Comprehension 5), the interpolated "e" and some initial repetition appeared chiefly before words beginning with "b", "e", "f", "g", "l", "p", "t", "th", "w", and there was some repetition of words and syllables; e.g. in pale gray shadow hardly distinguishable from".

The speech disorder disappeared in reading along with the examiner. The trouble still persisted when he was left alone.

Examples of speech:-

School? Er-James Clark.
Class? Er- 1A technical.
subjects? An - er- English; er- geometry er-technical
drawing er-craft.

Like best? Aaaaarithmetic.

What do you do besides school work? I go with er-news-
papers and when I come home an-I read.

Games? Hide-and seek, football (then lowering of larynx
and cramping followed in some distress by) n-I
can't get it out. It er-an-er-it's cricket.

Responses during the Herring Revision:-

Test 1 (b). Her f-fuather brought her home and found her.
(first "f" strongly emphasised, second quite correct)

Stuttering appeared throughout the descriptions of the pictures.

Test 2. Numbers read through without stuttering .
Test 3. Chokes on certain letters as if retching, strain
on lip muscles on, for example, "f", lips pulled
back tight at the corners.

Test 4. er-er-er-a-491; er-7-er-7284; he-er-63845; er-er-29-
2973.

- Test 9. Single word answers gave very little or no trouble.
- Test 10. (1) an-ask a policeman
 (2) er-learn it at home or er-ask the teacher (cramp) to do it.
 (3) a-er-a-er-na is there only one shop in the (slight cramp) v illage?
 (4) er-er-er-work.
 (5) oh-ho-eh,-try to do an-do it again.
 (6) be-be-cause bad men might have er-rags.(lips strain on because).
- Test 11 Frequent repetition of word and complete reversal of main points of some sentences because of stuttering. Of. Test 1 (b).
- Test 12. Short sentences or single words almost without stuttering.

PSYCHOLOGICAL EXAMINATION

Intelligence

Herring Revision.

Group A	M.A. = 9 yrs. 7 mths.	I.Q. = 78	}	I.Q. = 80
Groups A.& B	M.A. = 10 yrs.	I.Q. = 82		

Burt's Graded Vocabulary.

Reading Age = 11.1 E. Q. 112.1

Character & Temperament

Pressey X-0 Test.

Test 1 Underlined 54.
 Circled:- Cinemas, football, Napoleon, athletic girls, reading, acrobats, bands, jazz, good boys, games, pageants, ice-cream, sleeping, engineers, Hamlet, church, drawing, sports, travelling, salesmen, magazines, electricity, chauffeurs, circuses, joy-riding.

Test 11 Underlined 45
 Circled:- Spitting, laziness, ignorance, fibbing, extravagance, slang, bluff, revolution, cad, day-dreaming, fault-finding, swearing, butting-in, disgrace, betting, idleness, cunning, greediness, cheek

Test 11, cont. lawlessness, bullying, gossip, borrowing,
sneering, teasing.

Test 111 Underlined 21
Circled:- School, sin, unfairness, failure
temper, nervousness, medicine, suspicious,
teachers, longings, boys, lessons, giggling,
parties, teasing, lies, dreams, chums, health,
stammering, roughness.

Scholastic

English (Burt's Northumberland)

	Score	E.A.
Test 1	46	15.0 (?)
" 11	41	12.8
" 111	23	12.6
" IV	15	11.9
" V	92	18.0 (?)

Tota: 217

E.A. (English) = 14.8 E.Q. = 149

Spelling (Fictation: Burt's Continuous Graded Test 7)
Score = 467 E.A. = 13.5 E.Q. = 136.4.

MEDICAL REPORT

- (1) Height54½ ins. Weight70 lbs.
- (2) Circulatory System:
- Pulse Rate 65
- Any abnormality of
Heart ActionNo
- (3) Respiratory System:
- Expansion of Chest2½
- Any deformity of Chest
and its natureNo
- (4) Nose, Throat and Mouth:
- Presence of enlarged
Tonsils or Adenoids Yes
- Presence of nasal
obstruction.Dev. septum to right.

Any structural abnormality
of teeth (rickets etc.).....Crowded mouth

Any structural abnormality
of palateGothic

No structural abnormality
of throatNo

Prominence and thickness
of lips or otherwiseNo

(5) Nervous System:

State of Pupils:moderately contracted .

Re-action to light Yes

Presence of deafness No

Tremor No

Knee-jerksneither exaggerated nor diminished

Case 18.

Age. 11 yrs. 10 mths.

P. or G. Both alive and well.

B. None.

S. One; died at 19 months in 1925.

Class L A1 Q. (No)

W. About 13 to 14 months.

I. Measles twice; chickenpox, abscess on throat at 7 ;
frequent chest colds; operated for adenoids and ton-
sils at 5; general health good.

Problem. STUTTERING

FAMILY HISTORY. Information supplied by mother.

The father is in regular employment as a cleaner in the
Edinburgh Corporation Transport Department. The family
has always lived in Edinburgh. He was in the army during
the War. The father belongs to Edinburgh and the mother
comes from South Wales. Her speech still bears its
pleasant natural dialectal characteristics. There is no
evidence of left-handedness in any members of the family,
but both the father and the mother used to stutter. As a
child the father was subject to frequent complete speech back-
ings. The mother's stuttering, according to herself, lasted
until/

until she was 16, but although she speaks well now, the stuttering characteristics on initial letters are still quite evident under close observation. There is still marked fluctuation or uncertainty of attack on some initial consonants. The brother of the father also stutters but this, the mother thinks, may have been the result of the war. The mother is a nervous type.

PERSONAL HISTORY: Ralph had a natural and not difficult birth, chloroform being used and the mother being in good health and not excessively nervous at the time. Ralph was breast-fed for the first 7 months of life and bottle-fed thereafter because the mother developed an abscess in the left breast. Weaning was sudden. He was not an irritable baby and there was no trouble over feeding, but his appetite now is only moderate. He does not like porridge, vegetables and vegetable soup. It was not necessary to take steps to prevent him thumb-sucking. He still bites his nails and picks his fingers round the nails, though not so badly as he used to. Until recently there was frequent enuresis, but this has now almost disappeared. Ralph always had a slight stutter which, after growing worse, has now begun to improve. The mother thinking that the speech disorder is always worse in winter and that this may be the result of the boy's getting into a run-down condition, has given him Malt and Cod Liver Oil. Ralph will not go for messages because of the speech difficulty, especially in saying his own name. He stutters always on the words "Dobie" and "Quarter" (asking therefore always for 4 oz.). He refuses to go with a note of what is required because he thinks it beneath his dignity. He "slurs his words", especially the first letters.

Ralph has never been left-handed. He likes school and went willingly from the beginning at the age of 4½. He "studies well and is a great reader". He is interested in science and attempted to get a school bursary before he went to Bellevue. He missed this by a few marks.

He has never been punished much at home. It is "impossible to drive him and he gets almost hysterical before he is even touched", that is, if punishment is threatened. The mother considers him highly strung and very sensitive, especially if he is teased. He speaks frequently in an excitable way and is very nervous in speaking to strangers. He is afraid of the dark or of staying in alone; he sleeps well and gets up early and willingly. He goes out and plays with other boys a great deal and appears to be on good terms with the boys. He is a member of the Scouts and goes to a church choir every week, which the mother thought would be good for his/

his speech disorder.

INTERVIEW WITH RALPH Ralph is a fair-haired, good-looking boy, his attitude and responses during the interview being very intelligently co-operative and displaying a well-developed sense of humour. In response and general bearing he resembled George Wilson.

He says that he is nervous at school, especially when he has to speak. He has always liked his teachers and has never been punished frequently. He is near the top of his class at school. He used to be afraid of the dark, but he is not so now. About the age of 6 he had a bad fall after dark. He dreams sometimes, chiefly about his games, but he has not had any dreams recently and says he cannot remember those that he has had. His speech disorder is always worst in school and he corroborates his mother's statement that it always occurs on the words Dobie and quarter. He does not always stutter when he is with other boys and only sometimes does so at Scouts.

In ordinary conversation his speech was characterised chiefly by frequent repetitions of initial consonants and by continuous audible expiration during speech, often conveying an impression of interpolated aspirates. He reads himself out of breath for this reason.

In reading isolated words (Burt's Graded Vocabulary), repetitive stuttering appears on nearly all of the m on the initial consonant or at the beginning of a new syllable, except for a few of the simple words at the beginning. His speech is throughout somewhat rough.

Similar characteristics appeared in the reading of continuous material, (Burt's Comprehension 5), although whole phrases would be read without stuttering. The repetitions were in evidence in all the stop consonants and "s", "l", and "th", as well as breaks in the middle even of one-syllable words; e.g. "shoo-ook the bottle".

In reading along with the examiner the speech disorder disappeared, but it persisted even when he is left alone. He has already tried this at home.

During spontaneous conversation or answers, as in the intelligence test, he was not unwilling to take the risks of a longish sentence and his sentence formation is noticeably good.

/

Examples of speech:-

Birthday? S-s-s-ssecond of J-j-july.

How long have you been at Bellevue? Er-sss-er-sssince
Christmas.

Where were you before? Er-s-t-t-t-t-ockbridge.

Class? T-t-t-one-A-one

Which hand do you throw a ball with? The r-r-r-right hand.

Repetitive stuttering appeared also on the following
consonants, "b", "d", "h", "k", "l", "m", "o", "p", "r"
"s", "t". "th" "y".

PSYCHOLOGICAL EXAMINATIONIntelligence

Chronological Age = 11 yrs. 10 mths.
Herring Revision.

Group A	M.A. =	16 years.	I.Q. =	135
Groups A & B	M.A. =	14 years 5 mths	I.Q. =	122.

Dynamometer

R.	22	23.5	22
L.	24	20	23

Ball. R. String R. Scissors R. Folding R.

Character & Temperament

Pressey X-0 Test.

Test 1 Underlined 95
Circled:- Boating, camping, Napoleon,
athletic girls, reading, acrobats, singing,
hymns, good boys, games, pageants, ice-
cream, clerking, aviators, Tarzan, church,
drawing, babies, travelling, soldiers,
books, machinists, doctors, country, seaside.

Test 11 Underlined 79.
Circled:- Spitting, laziness, ignorance, fibb-
ing, talking-back, slang, debt, revolution,
cad, slowness, divorce, cowardice, stupidity,
disgrace, conceit, pride, cunning, greediness,
stealing, lawlessness, bullying, gossip,
bribery, dirtiness, teasing.

Test 111

Underlined 76

Circled:- Loneliness, sin, meanness, failure, pain, fire, noise, death, lightning, rivals, falling, suffocating, lessons, crowds, nightmares, jealousy, sleep, lies, fainting, darkness, crying, health, stammering, roughness.

Scholastic

English (Burt's Northumberland).

Test 1	Score	E.A.	
	47	16.0	
" 11	47	14.5	
" 111	4 2	21	
" 1V	1 7	1 3.2	
" V	10 4	1 9.5 (?)	
Total 257		17.5	E.Q. = 115.6

Spelling (Dictation: Burt's Continuous Graded Test 7).

Score = 497

17.5(?)

E.Q. = 115.6

TEACHER'S REPORT

- (1) Average age of class12 years 3 months.
- (2) Position in class19th out of 47.
- (3) General quality of work..... Careful.
- (4) General attitude to work..... Careful
- (5) Does he show any desire to
be near the top of his class?..... Yes
- (6) Is he nervous in class?Nervous at first acquaint-
ance but gains confidence later.
- (7) Is he willing to answer
questions?Yes
- (8) Does he read in class?.....Reads (very keen)
- (9) Does his work show any specific
defects?No. on the contrary spell-
ing, etc. V.G.
- (10) Is he punished frequently?.....No, (not at all)
- (11) Does he always stammer?Yes, in class
- (12) What are his relations with other
children?Confident.

(14) Is he frequently absent from school?..No. perfect attend.

Very keen to read and very anxious to get over his disability.
Very find boy in ability and character.

Case 19

Age 6 yrs. 11 mths.

P. Both alive and well.

B. One, aged 10 yrs. 1 mth.

S. (A) 12 (B) 6 months.

Q. (No).

W. 16 months.

T. about 15 months.

I. Measles slight in infancy; not operated for adenoids and tonsils but doctor has recommended; no history of frequent colds; subject to chills in the stomach.

Problem. STUTTERING.

Information supplied by the mother:-

FAMILY HISTORY: The father is employed in the Edinburgh Corporation Transport Department. The mother is English (Herefordshire), and her dialectal peculiarities have had some influence on Andrew's speech which is, however, better than that of most Edinburgh children of his age, social class and district.

There is no history or evidence of stuttering in any other members of the family. None of the family are or are known to have been left-handed. There is no evidence of other speech troubles and no indication of instability in the father or mother.

PERSONAL HISTORY. Andrew's birth was difficult and instrumental, but the mother herself was in good health at the time. He was a bottle baby from the outset and was not a greedy feeder. He was weaned about the age of 14 months gradually. No trouble arose at any time over infantile feeding. His appetite now is healthy, but he is not fond of broth and vegetables. A comforter was not used and although the mother can produce no evidence of prolonged thumb-sucking, he still has to be checked for putting things in his mouth. Nail-biting is very marked. There is no history of nocturnal enuresis, Andrew having been easily trained from the beginning, (enuresis, however, still persists in the older brother/

brother). Andrew is definitely left-handed. In the course of the Stanford Revision Test there was opportunity to note this in the diamond drawing of the ball and field test. He writes with his left hand at school, but no attempt has been made there to change his handedness. He uses, at home, impliments, e.g. at table with his left hand. Some attempts have been made to alter this, but he has always gone back to his left-hand manipulation.

The mother was advised to allow him to follow his inclination.

His speech was good at the outset. Such stuttering as there has been began about the age of four, just before he went to school (at age 5). After he went to school it grew worse, but the mother thinks that it is now improving very decidedly and a conversation with Miss Murdoch, which she reports, seems to indicate that the speech disorder has now much diminished even in school. On the teacher's showing it appears that he only occasionally shows some slight inclination to stuttering in reading. He is still with his first teacher and already has shown that he does not like to be absent from school. He went willingly to school at first and is said to be clever, but given to fidgetting in school. Although she reports that he has been considered excitable by others, the mother herself sees no marked evidence of this trait in Andrew.

At home he is intelligently talkative and can tell stories well; e.g. of a film he has seen. He is not very aggressive and rather orderly. He has been thrashed sometimes by his father (the mother expressed only qualified agreement with this treatment), but never for stuttering. He is not shy, but quite confident in his dealings with other children. He goes out willingly to play and is not timid, although he does not like to be left alone in the house. He is not afraid of the dark, always goes to bed without a light about 8 o'clock and gets up promptly in the morning. He sleeps quite well with his brother. There is no indication of further causative or contributing factors.

INTERVIEW WITH ANDREW. Despite some nervousness while he was left alone in the waiting room, Andrew's attitude during conversation and the various tests was, for a child of his age, exceedingly good, and very co-operative although fatigue and perhaps some boredom set in towards the end of an unduly prolonged interview. Andrew shows a slight squint and facial asymmetry, the right side of the face being slightly more prominent than the left. The lips are not unduly prominent, but are protruded in speaking. It was almost impossible to obtain the slightest indication of speech disorder at the Clinic. At the beginning a slight hesitation did appear/

appear with a slight tendency to close the lips tightly before beginning to speak. Andrew talked freely and intelligently.

There was no stuttering (a) in spontaneous conversation and in answer to questions; (b) in reading of isolated words (Burt's Graded Vocabulary), up to and beyond his ability; (c) in reading and reciting "Five Little Pigs", (d) in reading easy prose.

PSYCHOLOGICAL EXAMINATION

Intelligence.

Chronological Age = 6 yrs. 11 mths.

Stanford Revision.

M.A. = 7 yrs. 8 mths. I.Q. = 111.

Burt's Graded Vocabulary.

Reading Age = 6.8 E.Q. = 88.3

Scissors L String L Ball L Folding L

TEACHER'S REPORT

- (1) Average age of class.....7
- (2) Position in classGood average
- (3) General quality of workGood
- (4) General attitude to work.....Careful
- (5) Does he show any desire to be
near the top of his class?Yes
- (6) Is he nervous in class?.....No
- (7) Is he willing to answer questions? Yes
- (8) Does he read or recite in class?...Yes..Both reads & recites
- (9) Does his work show any specific
defects?.....No
- (10) Is he punished frequently?..... Disturbs work of class
- (11) Does he always stammer?.....No. Least evident when
taking ordinary part in work.
Most when excited about anything.
- (12) What are his relations
with other children?Aggressive. Confident.
- (13) Is he a leader in play?.....Yes
- (14) Is he frequently absent from
school?.....No

He appears unable to sit still for more than five minutes at a time. Writes with left hand. Has improved since he came to school.

MEDICAL EXAMINATION

- (1) Height.....46 ins. Weight.....42½lbs.
- (2) Circulatory System:
 Pulse rate 104
- Any abnormality of
 Heart Action No
- (3) Respiratory System:
 Expansion of Chest 2"
- Any deformity of Chest
 and its nature No
- (4) Nose, Throat and Mouth:
 Presence of enlarged
 Tonsils or Adenoids Slightly
- Presence of Nasal
 Obstruction yes. marked
- Any structural abnor-
 mality of teeth.....No
- Any structural abnormality
 of palate Highly arched - gothic.
- Any structural abnormality
 of throat.....No
- Prominence and thickness
 of lips or otherwise No
- (5) Nervous System:
- State of Pupils: moderately dilated.
 Re-action to light Yes
 Presence of deafness No
 Tremor No
 Knee-jerks Exaggerated.
- State of skin Dampness.
-

Case 20

Age. 11 yrs. 10 mths.

P. Mother alive and well (see Family History).

Two step-brothers, (a) 22 yrs. (B) 18 yrs.

W. Late: nearly 2 yrs.

Class. Sen 3A (Qual.) No.
T. about 18 mths.

I. Whooping cough (about 14 months). Measles (before school)
Pneumonia slight (10 yrs.). Operated for Tonsils and Adenoids
(about 8½).

Problem. STUTTERING.

Information supplied by the step-father, amplified and corroborated from information later obtained from the mother.

FAMILY HISTORY. The mother, is a large woman whose appearance and manner combine to suggest that she might, on occasion, become unpleasantly aggressive. She shows, however, a greater degree of affection for and interest in Alec than the circumstances of his birth and early up-bringing might have been expected to induce. When she met Alec's father, to whom she was never married, she was in the W.A.A.C's, having joined up during the War. Before Alec was born his father had disappeared and nothing has been heard of him since. It is not clear how long the mother had to support the child and herself before she met her present husband, but the period seems to have covered the greater part of Alec's first year of life. The step-father knows little or nothing of Alec's father, and the subject is seldom raised between the husband and wife.

The step-father's chief employment since the War seems to have consisted of washing motor-cars, but he has now been continuously unemployed for twelve months. He gives the impression of being not unintelligent and of having a real interest in the children. As a result of enteric fever contracted in India, he is very deaf. He is a rapid, nervous speaker, the arhythmic hesitant character of his utterance amounting almost to a stutter. Apart from the step-father and mother and Alec, the present household includes also two sons of the step-father's by a former marriage, aged respectively twenty-two and eighteen; and two daughters by his present wife, who are age eight and five.

No other members of the household have ever shown any tendency to stutter. Alec's father had no speech difficulty and nothing is known of his relatives. The mother has one brother who stutters.

In general, the mother, who is a twin, has had good health/

FAMILY HISTORY, cont.

health and her family - she is one of ten - have been very strong.

There is no traceable evidence of left-handedness.

PERSONAL HISTORY: The circumstances of Alec's birth, his mother being unmarried and his father having disappeared, were unpropitious. The mother was in a highly nervous condition and confined to bed for some two or three months before the birth. The birth, itself, however, was easy and natural, although premature. Alec was a very small and unhealthy baby. For nearly two months after birth it was impossible to bathe him, he being simply rubbed down with cotton-wool. He required nearly constant medical attention during the first two years of life, during which the doctor at one time suspected hydrocephaly. During infancy he had a skin-rash for a long time. He was not vaccinated until he was over a year old. He had whooping cough very badly when he was just over one year old, and twice in one day during the illness had convulsive "fits" in which he went quite stiff".

As soon as might be the mother had to go out to work to support herself and the child. During the greater part of the first year, therefore, he had to be left in the care of some other woman, and, according to the mother, "was knocked about from the beginning". He was never breast-fed, but was bottle-fed for about twelve months. He was a greedy baby, "never satisfied", and very fractious. "He cried from morning till night", and for long roused his mother every three hours during the night. Satisfactory information as to weaning was not obtained, although the mother says that it was not difficult. It would probably not be unfair to characterise it as careless.

A comforter was used at least through-out the first year Alec did not require to be checked later for thumb-sucking, but he still continues to bite his nails.

He has a good appetite now - the step-father says that he is "a heavy eater".- but does not like lentil soup, rhubarb, or sour things generally. Nocturnal enuresis persisted until about a year ago, since when it has ceased. Otherwise he was not difficult to train in control of the bowel and bladder function.

Alec went to school (Bristo Street) first at the age of $4\frac{1}{2}$ and has liked it from the beginning. He has always been very annoyed if he was likely to be late for school. He has always, so far as is known, been on good terms with his teachers/

teachers, and does well in class-work. His present teacher considers him one of her brighter boys.

At home he reads a great deal even bringing his book with him to meals and going straight to it first thing in the morning. He rises early (about 7.30 a.m.) of his own free-will, but is unwilling to go to bed at night, being sometimes up until 11 o'clock. Once in bed, if possible he lies awake to read. The step-father and mother agree that he has a bad temper. He is said to be nervous and cries at the slightest check or restraint. At a harsh word he flushes and goes off alone. He has not been much punished at home because he goes into a fit if he is. In a temper-tantrum he lies down and bangs his head on the floor, and is ready to hurl the first available missile at the object of his anger. He flares up in the slightest provocation. He fights with his next-younger step-sister. He obeys his step-father, but is more apt to be troublesome about his mother's orders. (From the apparent nature of the two people, this is almost certainly a reaction to the way in which the orders are issued). He becomes very angry if any of the others touch his belongings, and he is not infrequently teased by his older step-brothers who hide his books in order to excite him to a temper.

He does not play much outside the house and rather tamely allows the other children to hit him. He was even more cowardly when younger, and "howled for the least thing". He could never stand up for himself, but called for his mother as soon as he found himself in trouble.

He is shy and still afraid of the dark, requiring a light when he goes to bed. (If true, this may be, in part, a ruse in order that he may have the light for reading). He sleeps alone, and talks a little in his sleep. He has had no accidents. Alec's stuttering appeared slightly when he was about three years old. He then seemed to be forcing, or, as it were, choking the words out of his mouth. The speech-disorder has grown much worse since he went to school. He has never been scolded or punished for the disorder at home. No other speech defect has been noticed.)

INTERVIEW WITH ALEC

Alec is a well-sized boy for his age, pale and somewhat repressed in appearance. He shows distinct internal strabismus of the right eye. The lips are somewhat thickened and prominent but this should, perhaps be discounted in view of his generally rather heavy features.

Although the interview, apart from tests, was short Alec talked/

talked quite freely and with some appearance of cathartic relief about himself. There was some suggestion of self-pity and complaint against his environment, as well as of a desire, probably not often satisfied, to be "top-dog". He likes school, where he generally does well in class-work. "I'm er-er-the sixth ----- er the boys". He has now reached the qualifying stage. He takes his share of the oral work of the class. He is not frequently punished at school and, in view of his speech difficulty, has had some special consideration from his present teacher. He does not have much to do at home for school, and does not appear to take lessons too seriously. He told a story, with a rankling sense of injustice, of how he had been punished on the day of his visit to the Clinic for spilling ink while the teacher was absent from the room. Others who were implicated were not punished. He is nervous at school "when the laddies - er-make a fool of me".

At home "I'm always reading -----st-st-story-books" (adventure stories and various boys' papers). He goes to bed about eleven. Although his mother tries to make him go sooner he stays up to read. He can go to shops for messages if he has a note. He has not been much punished at home, but he is so when he strikes his sister because she will not go for errands. When this happens he flies into a temper at his sister.

He is a member of the Life Boys, but would rather be in the Scouts. He goes twice a week to pictures. He likes best those about murders and cowboys. He goes out to play and seems not infrequently to be concerned in fights. He says that he is bullied by the other boys and that they hit him a great deal. "If I go first-st-st-in a game, they hit me." He does not hit them back. They are bigger than he is and he is afraid of them.

Although the speech disorder was present throughout the conversation and the tests there was little that would ordinarily be called stuttering, there being little evidence of repetition of initial or other letters. Most frequently there would be a complete stop before a word (not always the first of a sentence or phrase) could be uttered, with a pause which might last for several seconds. During such pauses he sat quite still, usually with his mouth open and a rather blank expression on his face. The abdominal musculature was tense to the touch, but there was no evident spasmodic fluctuation. Some unnecessary tongue movements occurred in the mouth at such times. He says himself that he "can't speak right"; that he always has trouble, at home, outside with other boys who tease him about his speech, and in school. Apart from the speech disorder his spoken English for his age, school, and social class appeared to be rather good.

He dreams about the cowboys and murders he has seen on the films/

films. Hē recounted one incompletely remembered dream about himself. "I (long pause) was a (long pause) a boxer." (And what happened?) "I was knocking (long pause) the fellow out". There was a fight with another boy.

The speech disorder as described above persisted throughout the conversation and tests.

(A) In the reading of isolated words (Burt's Graded Vocabulary), measurable pauses occurred as long as 12 seconds, and these were not certainly the longest. The halts showed some tendency to increase in frequency as the material became more difficult. Pauses of varying length occurred before :- his, for, day, pot, now, that, some, told, love, water, carry, return, terror, beware, belief, fringe, luncheon, glycerine, melancholy, influential; and within certain other words as follows:- over ---whelmed, ex ---plorer, form ---mulate, con---tempt---uous, perpet---ual, peram * ---bulating (* with lips pressed together), excessively, rep---utation, melo---drama, bino---cular.

(B) In the reading of continuous material (Burt's Comprehension), the characteristics of the speech were as above, pauses appearing quite frequently from the beginning, where the material was well within his capacity. There appeared a slight tendency to repetitive stuttering on initial consonants, to repeat words (especially at the end of a line), and some difficulty with liaison, as in "his teeth", "him-self". In the middle of the second word, he as it were, makes a fresh start.

(C) In reading along with the examiner, the disorder persisted in some slight degree.

(D) There was still some evidence if it in reading alone.

(E) The following are examples of his speech in response to questions:-

School? Bristo School (without trouble).

Class? Er- Miss Paterson's (Before this the lips were shut tightly and pursed as for "m" for some seconds then clear speech on both words).

It's ---Senior 3a (pause for some seconds).

Brothers? Yes. He'll be ----nineteen on ---- on October .

Sisters? One's er ----er-five ---and --the other ----'ll be nine on September.

Age? I'll be ---- twelve on June .

(F) Examples of responses during the Herring Revision Tests.

/

Herring Revision Tests.

Test 1. (a). (Long halt before starting). ----It's a wee laddie c----coming home from fishin' and his mother's er-sur---prised er ---fetchin' home some fish.

(b). (No pause). It's aboot er-a----a man fetchin' a hurted -- in --girl intae a house and er---and er ---a---wumman's er - t-tellin' him to come in.

(Guttural stop lightly during pauses).

(c) (No pause). A woman's er --ask --- in a --- girl sumfin. That's a'.

(d) A woman's t-telephonin' and while she's -- while's she's er-speaking ---while she drops the hot water.

Test 2. Only halt: no stuttering on utterance.

Test 3. Expiration on "f"; breath lost.

Test 4. Long pause no stutterin g - sometimes interpolated. ssssseven' sssshix, three, eight, five, four (hhh= soft expiration).

thththth thirty-eight etc.

Test 9. ----B-lack: ----g----urey; in----wite.

Test 10. ----E ----a-----ask a policeman.
----D -do them at home and then d---do them at home too.

(Pause for thought quite different from halt; end of thought process visible).

----go----go to a ----nother shop.

G-g-g-go to the police station. They would hand you over to -- to--- C-cruelty to Children

Ssss ----p----practise the thing.

Test 12. (1) "When ye ---obey yer--teacher. That's a'".
(2) "That the hope that ---somefin'sss comin' true"
(3) "That ye have better clothes ---er-than other boys".
(4) "----That he ---dig up the land an' ye put in ---- in seeds an' that".
(5) "That's --That a--that a /

Test 5. "That's ---That---that a person takes you into their house and gives ye food."

PSYCHOLOGICAL EXAMINATION

Intelligence.

Chronological Age = 11 yrs. 10 mths.

Herring Revision.

Group A M.A. = 11 yrs. 11 mths. I.Q. = 101
 Groups A & B M.A. = 10 yrs. 10 mths. I. Q. = 92

Burt's Graded Vocabulary

Reading Age = 11.8 years. P.Q. = 103.5

Temperament & Character

Pressey X-0 Test.

Test 1

Underlined 26

Circled:- Cinemas, football, Napoleon, bands, good boys, clothes, pageants, ice-cream, actors, Tarzan, science, newspapers, circuses, fishing.

Test 11

Underlined 79.

Circled:- Smoking, laziness, fibbing, boasting, slang, debt, revolution, cad, day-dreaming, gang, bashfulness, leaving home, betting, slyness, cunning, kidding, pitch and toss, lawlessness, broker, gossip, drinking, sneering, teasing.

Test 111

Underlined 78

Circled:- School, sneer, meanness, discouragement, pain, insult, habits, suspicions, enemies, rivals, wrecks, reciting, lessons, crowds, nightmares, smoking, stylishness, drowning, ruin, burglars, twitching, over-eating, knives, stammering, roughness.

Scholastic

English (Burt's Northumberland).

	Score	E.A.
Test 1	39	12.0
" 11	37	11.9
" 111	27	14.4
" 1v	17	13.2

Case 21.

Age. 12 yrs. 9 mths.

P. or G. Mother alive, father died two years ago.

B. Two. (A) 24 (b) 15.

S. One. aged 21.

Class. (1H, post-qualifying) Yes.

W. 12 months.

T. about 15 months.

I. Summer diarrhoea during first year whooping cough at 18 months; measles, pneumonia; operated for tonsils about age 9; not subject to colds.

Problem STUTTERING.

The information was supplied by the mother.

FAMILY HISTORY. The mother is a capable, intelligent, apparently well-controlled woman. She has had good health and has had no nervous trouble except for anxiety during the War, induced by the air raids. The father, who was an engineer, died about two years ago of locomotor ataxy. The mother knows of no other stuttering in the family and there is no left-handedness.

PERSONAL HISTORY. John had a natural birth, the mother being in good health at the time. He was breast-fed for about the first nine months of life and was never bottle-fed. He was gradually weaned, was not fractious nor greedy and gave no trouble over feeding. He cut his first teeth without trouble. He was a small baby, but thrived quite well from the beginning. He was, however, delicate during infancy and suffered from frequent illnesses until he was about five years old. The mother says "that she has spent more on doctors' bills for him than on all the rest of the family put together". His general health is now good. On principle, the mother never used a comforter. He has a healthy appetite and refuses nothing. It has never been necessary to take steps to prevent thumb-sucking or nail-biting. Habit training has been easy and there has been no enuresis. There was no speech trouble evident at first. The stuttering was not noticed until he went to school at five. John cried a great deal and he resisted being taken to school on the first day, but settled down at once. There has been no trouble of any kind with regard to the school situation since. He has always been on good terms with his teachers, does reasonably well at school, but "is not studious". The degree of the speech trouble varies considerably from time to time and it is always worse when he is excited or if he is taken by surprise by a question.

At home the mother says that he is talkative, but quiet and/

and uncommunicative. Conversation with John suggests that there is some truth in this paradoxical characterisation. With strangers outside his own home he is very silent. He is not much punished at home and has never been in serious trouble at school, although he has been strapped for talking.

The bond between John and his mother is very strong. She says that he gets on better with her than with other members of the family. She admits that he has been treated with a certain indulgence because of his early ill health and partly perhaps because he was the baby of the family. As described by his mother, he has a well-developed sense of responsibility. As a small boy, he was very helpful about the house. He began recently to carry milk in the mornings of his own free will, with the explicit aim of earning money. He goes to bed about 8 o'clock without having to be told, gets up about 6.15 a.m. and has a cup of cocoa before leaving the house. The mother has noticed a very marked improvement in his health since he began to go out in the mornings. The father being dead he would like to start work.

On two occasions recently there has been slight trouble with the police over mischievous damage, but he paid for the damage himself out of his savings. He mixes freely with other boys and has just joined the Boys' Brigade. The mother thinks that he is a follower rather than a leader. He is neither quarrelsome nor specially timid.

There have been no nightmares, though he occasionally talks in his sleep about play. He is not nervous nor afraid of the dark, but for a long time when he was a small boy he would leave his own bed to go to his mother if he awoke during the night.

The mother is a bright intelligent woman with a high opinion of John, though not of his intelligence.

INTERVIEW WITH JOHN. John was smart, well-dressed, co-operative in conversation and in the tests and displayed considerable responsibility in his attitude. His lips are not thickened, but are slightly protruded and pursed. There is slight facial asymmetry.

In conversation he showed a frequent repetitive stutter/

stutter on initial letters including "b", "d", "f", "g", "h", "l", "m", "o", "p", "r", "s", "sh", "t", "w". Along with or independent of this repetition the more pronounced phenomena were the prolongation of the initial consonants of words and syllables, and the marked prolongation with tremolo effect and mal-articulation of the following vowels which in such cases would be distorted and sometimes changed completely. Into consonantal combinations at the beginning of a word, e.g. "pr" "fr", "sp", "gl", he introduced a very marked indefinite vowel sound, thereby almost adding an extra syllable to the word. E.g. g(e) lycerine; in the same way, p(e)rison, f(e)rothed, s(e)pear-like. This was a stuttering characteristic and not due to slovenly speech, as is indicated by the fact that this interpolation disappeared under conditions which brought about a diminution of the disorder. Repetitive stuttering on initial vowels also appeared. John's stuttering, according to himself is usually at its worst in school and, in general, worse than it was during conversation at the Clinic. He has always liked school and environmental mal-adjustment was not traceable in this first cursory examination. John has no idea what he would like to do when he leaves school. He carries milk in the mornings and is a message boy with McVitie's (bakers) all day on Saturday. These activities he treats definitely as work, but appears to enjoy them and the responsibility. He goes to bed each night about nine o'clock and gets up at 6 a.m. He has no memory of his dreams.

Examples of stuttering responses.

- (a) School? B-broughton sssseeecsecondary.
 How long? Sssince the ssssummer holidays.
 How old? Twelve
 Birthday? Th-th-thiirtenth J-j-july, 1919.
- (b) Responses to Herring Test 14.
- (2) He's b-b-been out swimming. He's held on toh the p-p-piece of wood.
- (3) It's been rrr-nin' ----it's been rrr-nin' before the sunshine.
- (4) Sh-sh-she's fell in a dub.
- (5) A smash (no stuttering).
- N.B. Repetition of words and whole phrases above.

In reading isolated words (Burt's Graded Vocabulary), the stuttering condition was not marked, but increased slightly on the more difficult words and on words of more than one syllable. Initial repetitive stuttering appeared on "girl", "labourers", "domineer", "fatigue", "melodrama" "melancholy"/

"melancholy". In spite of instructions to read slowly, John read rapidly and nervously.

In reading continuous material (Burt's Comprehension 5), the stuttering appeared intermittently, considerable stretches being read without appearance of speech difficulty. Here again there was some tendency for the trouble to increase as the passage increased in difficulty. Examples here are "prison" "frothed", "spear-like" (see above) "le-level lines", "g-g-gradually", "Wwwwiilliam", "aaanyone".

In examples like "William" the narrow vowel of correct speech is begun correctly, prolonged and broadened as the transition is made to the following letter, the "i" here developing into an open "e".

In further reading of continuous material along with the examiner there was no trouble at all. When John was left alone, the speech disorder also disappeared completely. Asked to read isolated words and continuous material with special attention to slow speech, John read well with no trace of stuttering, nor of vowel distortion.

Herring responses.

Test 1(1) fiishing ("f" over-emphasised); wa-walking;
 baare ("a" becomes open "e")
 (2) D-d-door; lou-looking;
 (3) Shshshei (= she).
 (4) tel-eph-phone (first syllable over-emphasised);
 f(e)loor; taaable.

In test 2 and test 4 all the responses were given without trace of stuttering.

Test 10. (1) Ask s-someb-body where yare.
 (2) Tell the-the-----the ta-e-echer that-that they're
 too hard and she-she' ll expl-plain it.
 (6) Y-y-y-if a man has goooowd clothes, he is

Test 11. H-h-h-er job w-w-was to lowk after sheep.

Test 12. One's an aw-awful brag.

PS YCHOLOGICAL EXAMINATION

Intelligence

Chronological Age = 12 yrs. 9 mths.

Herring Revision.

Group A M.A. = 13 yrs. 4 mths. I.Q. = 105
 Groups A & B M.A. = 11 yrs. 8 mths.

PSYCHOLOGICAL EXAMINATION, cont.Dynamometer

R.	22	22	25
L.	22	19	23

Ball R. Folding R. Scissors R. String. R.

Character & Temperament

Pressey X-O Test.

Test 1 Underlined 49
 Circled:- Fortune-telling, football, Edison, athletic girls, walkin , acrobats, bands, jazz, good boys, games, pageants, ice-cream, sleeping, actors, Tarzan, church, drawing, animals, travelling, teachers, newspapers, cards, professors, circuses, racing.

Test 11 Underlined 64.
 Circled:- begging, laziness, ignorance, recklessness, talking-back, stubbornness, debt, war, meddling, day-dreaming, gang, swearing, butt-in, fighting, betting, slyness, absent-mindedness, greediness, stealing, strike, bullying, yelling, borrowing, dirtiness, tale-telling.

Test 111 Underlined 50
 Circled:- Loneliness, headache, clothes failure, temper, fire, manners, death, lightning, police, wrecks, suffocating, poison, crowds, athletics, teasing, sleep. lies, ruin, burglars, crying, health, grave, stammering, detectives.

Scholastic
 Spelling. (Burt's Northumberland)

	Score	E.A.
Test 1	41	125
" 11	36	11.7
" 111	28	14.5
" 1V	20	17.0 (?)
" V	70	13.8
Total-	195	13.5

E.Q. = 108

Scholastic, cont.

Spelling (Dictation: Burt's Continuous Graded Test 7)

112

Score = 472

F.Q. = 14.0

E.Q. = 110.5

MEDICAL EXAMINATION

- (1) Height58 ins. Weight81 lbs.
- (2) Circulatory System:
- Pulse Rate100
- Any abnormality
of heart action.....Mitral systolic murmur -
Heart enlarged. AB in 6th space
 $\frac{1}{4}$ " outside nipple line.
- Expansion of Chest2 $\frac{1}{2}$ ".
- (3) Any deformity of Chest.....Moderate degree ^{ri}skets.
and its nature.....Deformity of sternum.
(depressed at distal end).
- (3) (Respiratory System.)
- (4) Nose, Throat and Mouth:
- Presence of enlarged
tonsils or adenoids.....removed age 9 yrs.
- Presence of nasal
obstructionNo
- Any structural abnormality
of teethNo
- Any structural abnormality
of palate.....No
- Any structural abnormality
of throatNo
- Prominence and thickness
of lips or otherwiseNo
- (5) Nervous System:
State of Pupils:.....moderately dilated
Re-action to light.....Yes
Presence of deafness.. No
Tremor.....(No) Knee-jerks. Exaggerated.
- (6) State of Skin Slight dampness.

Case 22.

Age. 9 yrs. 7 mths.

P. or G. Parents both alive and well.

B. Two. aged (A) 11 yrs. 10 mths. (B) 16 months.

S. One. Aged 8 yrs. 1 mth.

Class Sen. 1B. Q. (No)

- I. Measles; chickenpox; scarlet fever and pneumonia before school, rather serious; operatedn for adenoids and tonsils about 6 years.

Problem. STUTTERING.

FAMILY HISTORY: Information supplied by the father. The boy was brought to the Clinic on the first occasion by his father, an intelligent man with a keen interest in, and no little understanding of the development, of his children. The father is a motor driver who has been unemployed for the last three months, after a long period of continued employment driving cars and lorries. He is having difficulty in obtaining work because of his age (39). He is a clean smart man with a nervous, hesitant speech which just fails to manifest definitely the phenomena of stuttering.

There is no evidence of left-handedness or of stuttering in other members of the family over three generations. The father, is, however, not unaware of the character of his own speech as described above. There have been no other speech disorders in the family and no definite evidence of instability, except for the nervous, self-conscious attitude of the father during this interview. So far as the father can tell George had a natural birth without unusual difficulties, the mother being in good health at the time. George was bottled from the beginning and at an early age began to show traces of a determined nature, amounting almost to stubbornness. The boy has only a moderate appetite now - "not a strong appetite" - and always hurries over his meals. He used to be given to sucking his handkerchief, but having been frequently checked for this, he has given up the practice. He still bites his nails. Nocturnal enuresis persisted until about a year ago. The parents having taken medical advice in this matter, George was never punished for it, but whenever possible was awakened during the night. There has been no trouble of this kind during the last year. The father thinks that the stuttering has been present almost from the beginning of speech, but is worse on some occasions than on others. It is very troublesome when he is excited, more particularly when he fights with the older members of the family. Although George now likes school, he did not settle down well at first when he went to Towerbank. It is difficult, as George is not specially communicative about his life at school, to say just where the trouble lay.

Recently, however, since his going to Stockbridge School a year ago, there has been a very marked improvement in his general attitude and in his attitude towards school. This has been noticed by both the father and mother. He now has, for the first time, a male teacher, Mr. Younger, for whom he has a very considerable respect. It is to this most of all that the father traces the recent development, as a result of which George is personally cleaner and more responsible and less given to worrying about school than he was during the early part of his school career. His reports indicate that George does reasonably well at school, without being the top of the class. He does his lessons at home conscientiously and reads a good deal.

At home the most marked trait of his character is an evident stubbornness. He is rather inclined to cry on slight provocation and, although obliging enough, he will sulk if he does not want to do as he is told.

The father considers that in this respect he has quite a different nature from the other members of the family. He will not take a direct command nor respond to bullying, but has to be coaxed more than the others. When he is in a bad mood, "you may as well speak to the wall". He has not been much punished although he has had to be scolded for his direct refusals to obey his mother. He is not communicative. When he has toothache, for example, he will suffer in silence. Although he is shy of shows, he goes for his share of the messages and has been in no way indulged because of the speech disorder. Even as a small boy he was shy and excitable and seemed to be given to worrying. He flies into a temper readily when crossed by the other children and fights with the older ones. The father says that his own treatment of the children is easy-going - "the mother does the checking".

George goes out freely and is on good terms with his playmates. He was a member of the Life Boys, but left because the parents thought the company meetings took him too far from home at night.

There is no evidence of night-mares or fear of the dark. He goes to bed without a light and sleeps well.

INTERVIEW WITH GEORGE. Despite evident nervousness- George's face was flushed throughout the interview - there was little or no evidence of the stuttering in ordinary conversation and in answers to general questions. It appeared however when these were followed up with more formal tests of reading and speech. The boy's lips are markedly thickened and prominent, the upper lip being specially elongated. There is slight internal strabismus of the left eye.

George corroborates the reasons given by his father for his recent improved development. He is obviously happier at Stockbridge school than he was at Dalry or Towerbank. The reasons for this/

this improved adjustment are that he has not so far to go to school and that he likes a man teacher better than a woman and gets on better with Mr. Younger than with his previous mentors. He talked freely and interestingly about school and his out of school activities, describing his fishing excursions to Inverleith pond and the water of Leith. When he left the Life Boys it was not by his own desire and he would like to join the Cub Pack which meets nearer his present home. He does not have many home lessons, and at school is best at writing and drawing and worst at mental arithmetic. He would like to be a sailor. He has been punished at school "for not behaving", i.e. talking, but not very frequently. He dreams about his play activities. Stuttering occurs sometimes in school and sometimes outside, is worst when he is excited and appears even sometimes when he is talking to other boys. During his visit to the Clinic there was little direct evidence of the speech disorder until Herring, Test 11, almost the last test administered. There was no trouble in reading along with the examiner and nothing to note when he was left alone. In other situations, however, a greater or less degree of disorder of breathing appeared and sometimes, although distinguishable, this might be so slight as scarcely to affect the actual speaking.

In the reading of isolated words (Burt's Graded Vocabulary) no trouble at all appeared in the first half of the test, but in the second part there was occasional hesitation before some of the longer words, even when these were read correctly, - for example, steadiness, formulate, reputation, melodramatic. In some cases there was slight anticipatory vocalisation before speech or inspiration through the nose or expiration with loss of breath control, subsequently betrayed by sniffing.

In the reading of continuous material (Burt's Comprehension 5), he showed a persistent tendency to read himself out of breath and to attempt to continue the reading with insufficient air in the lungs. In this way breath control would be lost and the rhythm sometimes quite distorted; e.g. (a) "Have you any message for - for the - king of the Golden River?" (b) "but Tom only laughed at him - advising him to make himself comfortable-....(here, by the time he reached the last word he had no breath left and characteristically forced the stop consonant. At the end, after the word "distinguishable", which proved a stumbling block, the reading became much more disordered).

Responded during Herring Revision Tests.

Test 1. (c). There's a man re-reading a letter.

Breath control lost before speaking. Utterance as if through sobs. No noticeable cramping.

there/ Stuttering, however, hardly appeared until Test 11. Than

there appeared in the response at first a complete speech block with rapid flushing of the face. During this, short and rapid shallow inspiration and expiration were evident. His father describes this as being characteristic of the boy's speech - "like a boy that has been running".

During the responses he stopped frequently and gasped for breath, appearing to lose more than he inhaled. Here and throughout his speech the "s" sound was thickened and indistinctly articulated with the teeth closed and overlapping. The defective articulation was only in part the result of one of his front upper teeth being broken off.

PSYCHOLOGICAL EXAMINATION

Intelligence.

Chronological Age = 9 yrs. 7 mths.

Herring Revision.

Group A	M.A. = 10 yrs. 5 mths.	I.Q. = 109)	I.Q. = 110
" A & B.	M.A. = 10 yrs. 8 mths.	IQ" = 111)	

Burt's Graded Vocabulary.

Reading Age = 10.9 E. Q. = 103 .8

Dynamometer.

R.	13	16.5	15.5
L.	17.5	18	18

Ball R. Scissors R. Folding R. String R.

TEACHER'S REPORT

- | | | |
|-----|---|------------------------------|
| (1) | Average age of class |10 |
| (2) | Position in class |30/45 |
| (3) | General quality of work | Good |
| (4) | General attitude to work | Careful |
| (5) | Does he show any desire to
be near the top of his class? | No |
| (6) | Is he nervous in class? | Yes |
| (7) | Is he willing to answer questions? | Yes |
| (8) | Does he read or recite in class, |Always takes his
turn |
| (9) | Does his work show any specific
defects | No |

TEACHER'S REPORT, cont.

- (10) Is he punished frequently..... ..No
- (11) Does he always stammer?No
If not, when is it least,
and when most evident? when excited.
- (12) What are his relations with other ...Aggressive
children? Confident.
- (13) Is he a leader in play?would like to be.
- (14) Is he frequently absent from
school? No

Likes to fight other boys and after calls on his brother for help.

MEDICAL REPORT

- (1) Height $54\frac{1}{2}$ ins. Weight64 lbs.
- (2) Circulatory System:
Pulse Rate88
- Any abnormality of
Heart ActionNo
- (3) Respiratory System:
Expansion of Chest 2"
- Any deformity of Chest
and its natureNo
- (4) Nose, Throat and Mouth:
Presence of enlarged
Tonsils and AdenoidsRemoved age 4
- (5) Presence of Nasal
obstructionSlight. Dev. septum
- Any structural abnormality
of throatNo
- Any structural abnormality
of teethirregular in shape
and position
- Any structural abnormality
of palate .. No

Prominence and thickness
of lips or otherwiseNo

(5) Nervous System:

State of Pupils:Moderately dilated;

Re-action to lightBrisk

Presence of deafnessOccasionally -
Perforation of Rt. drum.
Otorrhoea occasionally.

TremorNo

Knee-jerks diminished.

(6) State of skin: Dampness.

Case 23

Age. 13 yrs. 6 mths.

P. or G. Mother dead; father and step-mother alive.

B. One married; one with father.

S. One married.

Class. Sen. 3B. Q. No.

Problem. STUTTERING.

INTERVIEW WITH AGNES. The child was sent to the Clinic in the first instance directly from school in the company of another girl who knew the way. Agnes lives with her grandmother, aged 79, and an aunt. Agnes' own mother died about 13 years ago and so far as she knows she has never lived with her father, who is now remarried, since that time. The grandmother has now been bed-ridden for four or five months. The aunt is working "in the mills". All three live in one room which they rent from a woman, referred to by Agnes as the woman next door. The aunt works very late (until 8 p.m.) and the woman next door makes dinner and tea for Agnes and the grandmother. Agnes is an "old-looking" child, and was not excited during the interview, although she appeared to be nervous. She described the family relationships so far as she knew them fully but not glibly, although at the beginning of the interview she was very repressed and only consented to speak above a loud whisper after repeated urging. She says that she has never lived with her father. Her aunt is married, but her husband does not/

not live with them. Agnes' account of the matter is that he "went away and took another girl, she's (the aunt) looking out for him and she canna get him".

Agnes does not get out much because she has to keep the house and look after her grandmother. She plays "for a wee while", but has no desire to be able to go out for a longer time. She goes to the pictures on Saturday with her small cousin. She likes the Micky Mouse pictures best, but showed no high degree of intelligent interest in what she had seen. She says that she has to do the house-work after school, including the washing of the floor, and is quite proud of it - "ma grandma said I'm clever". She is never punished by her grandmother and her aunt now. She does not bite her nails, although she used to until her grandmother punished her. She goes to bed every night about 8.30 p.m. She says that she eats a lot, especially rice because "Mrs? gives er-me and ma granny er-rice every day." She enjoys porridge every morning, but does not like soup or bread. She is afraid of the dark - "weir stair's ayeways dark" - and she sometimes gets frights there. She likes dogs.

She likes school and her teachers and is seldom punished. Whether for teachers or lessons she has no preferences "they'r all the same". She does not have many home lessons, is not good at sums and has had low marks at school. She seemed to know nothing of the Qualifying examination even as a possibility. She has had trouble with her eyes which has been somewhat relieved by clinical treatment. Her eyesight, however, is still bad and she has to sit near the front of the class at school in order to see the blackboard.

She has never been left-handed, writes with her right hand. The lips are neither thickened nor prominent. The stuttering she says is not bad. She stutters sometimes, especially when reading at school, but has little trouble at home. During the interview stuttering did not appear so long as she was allowed to use the loud stage whisper which she adopted at the beginning. With encouragement the speech improved in tone gradually but remained hoarse and wanting in voice.

Reading to herself the Herring Test, there was audible whispering. Her speech generally is poor and slovenly.

Under test conditions two peculiar defects of articulation appeared, initial "n" becoming "dth" or "thd" (e.g. dthine = nine and thdone = none), and initial "l" either/

either becomes or is preceded by a slurred "th" pronounced with the tongue protruded (e.g. "thabourer" = "labourer", "tha-level tha-lines" = "level lines".).

In reading isolated words (Burt's Graded Vocabulary) initial stuttering appeared after the first simple words had been passed and increased as the words became more difficult and less familiar. E.g. "commenced" with repetition and hesitation, "er-er-er-commiony" = "economy"; "fringe" over-emphasised "f"; "ur-urged"; "t-t-tsrudging"; "d-d-domineer".

In reading continuous material (Burt's Comprehension 5), initial stuttering appeared intermittently from the beginning, but was most pronounced where the word appeared to be unknown to the child. E.g. (a) "Whom sh-should he s-see". (b) "but-but Tom only laughed". (c) "sh-sh-shouted" (= shoulders). (d) "t-t-till it fruit again" (= frothed again).

Invaour the "v" became assimilated to initial "f" and like the "f" of fringes was prolonged and over-emphasised.

Responses during the Herring Revision.

Test 1(a) An-an-that-er woman's t-t-t-rying to come doon the st-stairs to to him - A think he's goin' - goin' to throw something at the woman (N.B. Enumerative response).

Test 1(4). This woman's holdin' something in her mouth. She's holdin' something in her handetc.

Test 3. T-t-The river overflowed its bank. The streets were c-c-covered with a lot o'houses.

Test 4. e-e-e-e-ight two.
f-f-four dthine one.
N.B. also free = three.

PSYCHOLOGICAL EXAMINATION.

Intelligence.

Chronological Age = 13 yrs. 6 mths.

Herring Revision.

Group A	M.A. = 7 yrs. 6 mths.	I.Q. = 56
Groups A & B	M.A. = 7 yrs. 11 mths.	I.Q. = 59

Burt's Graded Vocabulary.

/

BURT'S GRAD'D VOCABULARY, cont.

Reading Age = 10.1 E. Q. = 131.6

Dynamometer

R.	12	17.5	16
L.	12	12	13.5

Scissors R. String R. Ball R. Folding R

Temperament & Character

Pressey X-0 Test.

Test I Underlined 91.
 Circled:- Mountains, tennis, pretty girls, dancing, talking, singing, hymns, handsome boys, games, ice-cream, sleeping, engineers, prayer, drawing, children, business, teachers, books, bargains, doctors, cities, seaside.

Test II Underlined 62
 Circled:- Smoking, laziness, ignorance, nagging, talking-back, slang, bluff, kidnapping, toughness, worry, spending, fault-finding, outcast, cribbing, fighting, grumbling, chewing, cheapness, dancing, cheek, strile, bullying, gossip, borrowing, quarrel, tale-telling.

Test III Underlined 31
 Circled:- School, headache, sickness, accidents, pain, fire, habits, death, lightning, homeliness, falling, conscience, poison, girls, giggling, parties, smoking, dances, marriage, whisperings, ruin, fainting, crying, dirt, stammering, childishness.

Scholastic:-

English (Burt's Northumberland).

	Score	E.A.
Test I	24	9.0
" II	26	9.6
III	17	10.5
IV	3	7.8
V	42	10.0

Total = 112

E.A. (English) = 9.4

E.Q. = 121

Spelling: (Dictation : Burt's Comprehension Graded Test 7)
 Score = 422 E.A. = 11.8 E. Q. = 152

Case 24

Age. 12 yrs. 6 mths.

P. or G. Both alive and well.

B. One, aged 22.

S. One, aged 21.

Class. 1st yr. post-
 qualifying. Q. (Yes).

W. 24 months.

T. About 18 months.

I. Nothing serious. Chickenpox, influenza, measles since school; not subject to colds; not operated for adenoids and tonsils; general health good.

Problem. STUTTERING.

Information supplied by the mother.

FAMILY HISTORY: The mother is a native of Northumberland and still displays the typical characteristics of her native speech. The father, however, who is a tram-driver, belongs to Edinburgh. The mother is very deaf.

The only traceable cases of stuttering in earlier generations are those of the mother's oldest brother and sister, who stuttered at school. The mother knows of none in the father's family. Neither of John's brothers has ever shown any signs of speech disorder. The father is left-handed. There is no evidence of nervous trouble in the family of either the father or the mother.

PERSONAL HISTORY. John had an easy and natural birth, the mother being in good health at the time. She had no reason to be unduly nervous. John himself was a healthy and thriving baby. He was breast-fed for a short time only. He had to be broken off quite suddenly, after which he became a Glaxo baby. He was always a "good" child, quiet and in no way troublesome over feeding. His appetite is still good and he displays neither strong preferences nor aversions. He never eats too much. Until he was over a year old John had a comforter. There was no necessity to use active measures to check thumb-sucking or nail-biting and there has been no enuresis, training having been easy/

easy from the start.

John has liked school from the beginning (Towerbank at age 5), and has gone willingly and has had no trouble with his teachers. He shows no inclination to take his work too seriously.

At home he is on the whole quiet, though he converses freely. He is an orderly child about his own belongings. He has never been punished, having been spoiled by his father as the baby of the family. The mother, however, adds significantly "that he is frightened enough by threats". He goes out a great deal to play with other boys and, so far as the mother knowledge extends, is not quarrelsome. He only displays shyness in the house of a stranger and seems to have a fair degree of self-confidence. He is afraid of the dark and is restless and kicks a lot at night, but sleeps well. He goes to bed about 9 or 10 p.m. at night and is always up about 9 a.m. He reads a great deal in the evenings. No contributing factors in the form of accidents or frights are traceable.

In general, the mother would not characterise the boy as being either excitable or nervous, though he appears to tell a story, for example, of a visit to the pictures in a somewhat excitable fashion. At home he only stutters sometimes. He does not stutter unduly in the presence of strangers when he tends to be rather quiet. The stuttering is always worse in moments of excitement. The mother could not date exactly the onset of the speech disorder, but says with some caution that she does not remember to have noticed it before John went to school. Before it started the boy showed a tendency to twist his head and mouth peculiarly. Even now it sometimes disappears altogether for a period.

John has never been left-handed.

INTERVIEW WITH JOHN. During this first interview John was shy, but not unduly nervous and gradually opened out and talked quite freely of himself and his doings. His lips are slightly thickened and prominent. He says that he likes school, but is never near the top of the class. He expresses no more definite ambition than that he would like "to be in an office". He attends Scouts every week, and has at least once taken a speaking part in a Scout play. He reads a lot at home, chiefly, it would appear, cheap boy's literature. He admits that he is still a little afraid of the dark and always has a light when he goes to bed. He thinks that his speech disorder has increased since he left Towerbank for Portobello Secondary School. He stutters at school sometimes, but does not admit that he feels nervous in class.

The stuttering is intermittent, there being occasions when the/

the speech disorder disappears completely. He says that he stutters at school when he is reading, but not when he is reciting. He can go for messages for his mother without a note. In conversation he says that he is only troubled "a wee bit", and that the speech disorder is at its worst "when I'm exk-cited" (the second syllable here was strongly over-emphasised as a result of tonic stuttering). In the Scout play he mentioned the speech disorder gave him no trouble. During much of the conversation here reported he spoke quite naturally, though there was a tendency, especially on the stop consonants, to tonic stuttering, with resulting over-emphasis, but not always repetition of the initial consonants, as in "cow-boy p-ppictures and racing pictures".

The following examples indicate the nature and the degree of the speech-disorder under the different conditions, specified.

(A) In the reading of isolated words (Burt's Graded Vocabulary), stuttering did not appear on the simple monosyllables at the beginning, the occasions in this test where more or less marked traces of the speech disorder appeared being:-

(a) on the initial letters of words - e.g. "carry", "village" "quickly". "tongue". "scrambling", "steadiness" "serious", "trudging" (rep. "tr"), "luncheon" (pron. l-er-luncheon).

(b) on the first letter of a syllable other than the first - e.g. "return" (t); "economy" (rep. "c").

(c) involuntary over-emphasis after a cramp of a syllable other than the first e.g. contemptous , "circumstances" "excessively" (prol. "cess").

The test was continued as far as the word "microscopical", some way beyond John's reading capacity , but there was no marked increase of stuttering on the later words.

The stuttering was predominantly tonic in nature, as is indicated by the fact that the sounds principally affected were initial stop-consonants and spirants.

(B) In the reading of continuous material (Burt's Comprehension 5), the phenomena of the speech disorder were similar to those that have already been described. The most noticeable characteristic was a tendency to slight tonic over-emphasis throughout the passage on nearly all initial consonants. There was a little repetition; e.g. "goo-goo-good morning", "gr-ground his teeth" In J-James's, in William's face" (N.B.correction); "c-c-cliffs".

As the passage grew more difficult towards the end, the repetition increased slightly.

- (c) Reading alone John had no trouble.
- (d) Reading along with the examiner, John had no trouble.
- (E). Examples of responses during the Herring Test.

Test 1 (a). "Coming home from fishing" (second "f" over-emphasised).

- (c) "A woman's t-told her s-something to make her d-disappointed".

Test 3. Repetitive stuttering rather marked.

Tests 2 and 4, Number Series and Digits Backward, no stuttering whatever.

Along with the phenomena already noted there appeared more clearly during this part of the interview slight distortion of the vowel sounds.

PSYCHOLOGICAL EXAMINATION

Intelligence

Herring Revision.

Group A	M.A. =	12 yrs. 11 mths.	I.Q. =	103
Groups A & B	M.A. =	12 yrs. 8 mths.	I.Q. =	101

Burt's Graded Vocabulary.

Reading Age = 12.6 years. W. Q. = 97.7

Dynamometer

R.	23	23	21.5
L.	17	19	18.5

Ball R. String R. Scissors R. Folding R.

Temperament & Character

Pressey X-O Test.

Test 1

Underlined 48
 Circled:- Beaches, camping, Napoleon, pretty girls, reading, acrobats, bands, jazz, good boys, games, pageants, ice-cream, typewriting, aviators, Tarzan,

church, drawing, sports, travelling, soldiers, magazines, electricity, chauffeurs, circuses, seaside.

Test 11 Underlined 46
 Circled:- Smoking, contempt, stinginess, fibbing, talking-back, clumsiness, debt, war, cad, spending, fault-finding, swearing, cribbing, leaving home, betting, pride, cheapness, greediness, stealing, strike, bullying, yelling, bribery, sneering, tale-telling.

Test 111. Underlined 53
 Circled:- Forgetfulness, headache, unfairness, failure, pain, nervousness, manners, death, enemies, homeliness, storms, suffocating, poison, friends, nightmares, jealousy, stupidity, drowning, fainting, burglars, twitching, healthm persecution, germs, childishness.

Scholastic

English (Burt 's Northumberland).

	Score	E.A.
Test 1	51	18.5
" 11	46	14.0
" 111	25	13.4
" 1V	25	(highest form 14.5
" V	85	= 18.1)
Total =	<u>232</u>	17.0

E.A. (English) = 15.8 (?) E.Q. = 123(?)

Spelling (Dictation : Burt's continuous Graded Test 7)
 Score = 457 F.A. = 13.1 E.Q. = 102

MEDICAL EXAMINATION

(1) Height56 ins. Weight75 lbs.

(2) Circulatory System:
 Pulse Rate76

Any abnormality of
 Heart ActionNo

(3) Respiratory System:
 Expansion of Chest2"

Any deformity of Chest
 and its nature ... No

MEDICAL EXAMINATION, cont.

(4) Nose, Throat and Mouth:

Presence of enlarged
Tonsils or AdenoidsNo

Presence of Nasal
ObstructionNo

Any structural abnormality
of palateHighly arched.

Any structural abnormality
of teeth3 carious well formed

Any structural abnormality
of throat

(5) Nervous System:

State of Pupils: moderately contracted

Re-action to lightBrisk

Presence of deafnessNo

TremorNo

Knee-jerksneither exaggerated nor
diminished.

(6) State of skin. Healthy.

TEACHER'S REPORT

(1) Average age of class 12-13

(2) Position in class 31st/34

(3) General quality of work Poor

(4) General attitude to work Careless

(5) Does he show any desire to be near
the top of his class? No

(6) Is he nervous in class? Yes

(7) Is he willing to answer questions? Yes

(8) Does he read or recite in class. Yes

(9) Does his work show any specific
defects -

(10) Is he punished frequently? No

(11) Does he always stammer? No

If not, when is it least, and
when most evident? At beginning of
his speech he stammers.

(12) What are his relations
with other children. timid, shy.

(13)/

TEACHER'S REPORT, cont.

- (13) Is he a leader in play?No
 (14) Is he frequently absent
 from school? ..No. has been twice absent
 with heavy colds.

Case 25.

Age. 11 yrs. 10 mths.
 P. or G Parents both alive.
 B. None.
 S. One. aged 6.

Class Advanced Division
 1B. Q. (Yes).

- I. Scarlet fever measles; whooping cough - none serious. Not subject to colds. general health good.

Problem. STUTTERING.

FAMILY HISTORY. Information supplied, by the father.:-
 The father, who accompanied the boy on his first visit to the Clinic proved to be a rather aggressive intelligent of the type generally described as "sharp", man, with a somewhat tense and penetrating manner which might well produce a condition of over-stimulation in a child. He has a clipped nervous speech.

There is no history of stuttering on the mother's side, but a parental uncle, who has stuttered from childhood, still does so slightly. There is no hint of speech disorder in Robert's small sister. Robert's maternal grandmother and one maternal uncle are both left-handed. The family can present a remarkably clean bill of health.

PERSONAL HISTORY. Robert had a natural birth, the mother being in good health at the time. The father would not describe her as a nervous woman. Robert was never breast-fed, but was a bottle baby from the beginning. He was always an irritable and worrying child. Between the ages of two and three, while on holiday in Fife, Robert had fits of some kind which caused some alarm. There has been no recurrence of these. Robert has a fair appetite, but has some aversion to broth and soups. A comforter was used to pacify him for a long time during infancy and he still shows a propensity for putting things in his mouth. He does not bite his nails. There is no evidence of enuresis and there was no difficulty of training him early in control of the bladder function.

/ Robert

Robert has never been left-handed.

He likes school and appears to do quite well. He has never given any indication that he has been worried about school and he has had no trouble with his teachers.

At home he is talkative and has never required much chastisement. He is afraid of the dark and even now refuses to go to bed alone. He sleeps well, but is restless and kicks a little. He is usually in bed from about 10 p.m. to 8.15 a.m. He is neither quarrelsome nor shy, but goes out freely to play. He gave up going to Scouts some time ago.

At the age of 4½ years, when the family were living in Auchinairn, Robert was run over by a push bicycle and had his leg broken. So far as the father remembers Robert had no trouble with his early speech and the stuttering indeed has hardly been noticed at home. The family were indeed surprised to have the Education Committee's letter with reference to the speech disorder and to find that Robert had been having serious difficulty in speaking in school, for about 4 years so far as the boy himself can tell. It is only now that the father has discovered that frequently he cannot utter a response in answer to a question in class. It would appear therefore that the speech disorder is always at its worst in school, but that it is affected by the presence of strangers. He has always been unusually neat and clean and particular about his personal appearance. But an excessive degree of orderliness or markedly possessive traits are not reported.

INTERVIEW WITH ROBERT. Robert is a smart, well-dressed boy tall for his age. He converses frankly and humourously, but showed a greater degree of anxiety with regard to and depression as a result of his speech disorder than many stuttering children. Apart from the speech trouble his attitude shows a well-developed sense of responsibility. He gets on well at school and is near the top of his class, being placed about 7th. He is best in mathematical subjects. His "I think I could have been nearer the top but for my answering" indicates both his fairly strongly developed competitive strain and the element of discouragement that appears to be present. He left his Scout troop some time ago, but intends to take up the organisation again. His chief out of school interest is in music. He has had violin lessons for some time and, although these are not now being carried on, he continues to practise on his own. He has already played on a number of occasions in public, having been a member of a small orchestra in Portobello. He would like to follow up this line of interest for his future career and appears to be thoroughly interested in his music.

His stuttering is always at its worst in school, though even there it does not always persist. Sometimes he comes to a complete stop, so that even when he knows the required recitation or the answer to the teacher's question he cannot bring it to expression. In school he is very nervous when he has to speak and has himself noticed how this contrasts with his freedom from nervousness when he plays the violin in public, even solo playing apparently occasioning no anxiety. Speech difficulty is liable to be increased when he has to talk to strangers. He selects "c", "f" and "w" as being difficult letters, although conversation shows that these are by no means the only letters on which he stutters.

During conversation at the Clinic stuttering appeared in various forms, both tonic and clonic, intermittently throughout the conversation. During speech he sat up erect and very tense, gripping the sides of the chair tightly and wearing a strained and worried expression. Short single-word answers to questions he could give with difficulty. During the various test exercises he showed himself quick to notice and react to any temporary improvement in his speech.

Nasal movements before utterance, especially before utterance of a letter which was causing difficulty, were very marked. Although both were present his speech is characterized less by repetitions and interpolations than by inopportune pauses before initial letter and the first letters of syllables, owing to very defective breath control. Spasmodic fluctuations of the diaphragm were very distinct during stuttering speech and frequently the quivering of the lips was quite evidently a consequence of the breathing difficulty.

The following examples indicate the nature and the degree of the disorder under the different conditions specified.

(A) In response to questions:

The speech disorder was somewhat more prevalent when he had to answer direct questions than it was in spontaneous conversation. Examples of this responses are :-

School? S-Tower - b-b-bank
 Class? Er-hhh-advanced 1B. (such attempts to speak immediately following involuntary expiration were not uncommon).

Qualifying? Yes, it's the first class after the k-hhh-qualifying.

/ B.

(B) In the reading of isolated words (Burt's Graded Vocabulary 1), The speech difficulty appeared, nearly always in the form of distorted breathing, intermittently throughout the test, even on quite simple words; e.g. big, pot, w-hhh-et; whhh-one; whhh-went; j-j-just; l-love (prol. "l").

(C) His reading of continuous material (Burt's Comprehension 5), was reasonably good, but the disordered breathing still persisted as above, especially in a tendency to read after all the air had been expelled from the lungs. There results from this the appearance sometimes of initial repetitive stuttering, but most frequently the distortion of the speech rhythm, and an uncertainty of attack on initial consonants. Neither in this test nor in the preceding did the speech disorder increase as the words became more difficult.

(D) In reading along with the examiner, The apparent trouble was much diminished although the spasms of the diaphragm were still present to touch.

(E) In reading alone he still had considerable trouble but considered his effort better than most of his reading in class.

(F) In response during the Herring Revision Tests the same speech characteristics persisted, with the notable exception that in Test 4, Digits Backward, he had no trouble even when his answers were wrong and when he knew them to be so. Robert says that he dreams a great deal, but can only remember one dream, perhaps with some fear component, of a boy who stole the canary from their house and then ran to the police station and said he was sorry.

PSYCHOLOGICAL EXAMINATION

Intelligence

Chronological Age = 11 yrs. 10 mths.

Group A M.A. = 12 yrs. 11 mths. I.Q. = 109
 Groups A & B M.A. = 11 yrs. 6 mths. I.Q. = 99.

Burt's Graded Vocabulary.

Reading Age = 12.4 F. Q. = 102

Dynamometer.

R	22	24	23.5
L.	25	23.5	24.5

Ball R. Folding R. Scissors R. String R.

Character & Temperament.

Pressey X-O Test.

- Test 1 Underlined 31
 Circled:- Boating, camping, Tennyson, walking, singing, solos, good boys, games, socials, ice-cream, musicians, science, animals, travelling, books, electricity, country, racing.
- Test 11 Underlined 70
 Circled :- Begging, laziness, ignorance, silliness, boasting, slang, debt, war, and, worry, gang, swearing, stupidity, leaving home, snob, slyness, cunning, greediness, stealing, black-leg, bullying, gossip, borrowing, bragging, teasing.
- Test 111 Underlined 25
 Circled:- Loneliness, headache, unfairness, accidents, disease, fire, manners, death, tiredness, dizziness, poison, giggling, nightmares, smoking, stupidity, lies, blushing, dreams, dogs, stammering.

Scholastic.

English (Burt's Northumberland).

	Score	E.A.	
Test 1	46	15.0	
" 11	41	12.8	
" 111	33	16.8	
" 1V	16	12.5	
" V	72	14.2	
Total	208	14.3	E. Q. = 117

Spelling (Ductation: Burt's Continuous Graded Test 7).
 Score = 467. E. A. - 111

MEDICAL REPORT.

- (1) Height 58 ins. Weight 74 lbs.
- (2) Circulatory System:
 Pulse Rate 76
- Any abnormality of
 Heart Action No
- (3) Respiratory System:
 Expansion of chest 2"

MEDICAL REPORT, cont.

Any deformity of chest
and its nature.Rachetic:- Flaring of Ribs.

(4) Nose, Throat and Mouth:

Presence of enlarged
tonsils and adenoidsRemoved age 6 yrs.

Presence of nasal
obstructionslight nasal catarrh

Any structural abnormality
of teeth (rickets etc.) ...No

Any structural abnormality
of palate ...slightly highly arched

Any structural abnormality
of throat ...No

Prominence and thickness
of lips ...No

(5) Nervous state.
State of Pupils: ...moderately contracted.

Re-action to lightAverage

Presence of deafness ...No

Knee-jerks ...slightly exaggerated

(6) State of skin : ... Healthy.

TEACHER'S REPORT

- (1) Average age of class12
- (2) Position in class 9th
- (3) General quality of work Good
- (4) General attitude to work ... Careful
- (5) Does he show any desire to be near
the top of his class? Yes
- (6) Is he nervous in class? No
- (7) Is he willing to answer questions? Yes
- (8) Does he read or recite in class? Yes - both
- (9) Does his work show any specific defects.....No
- (10) Is he punished frequently
- (11) Does he always stammer? ..No. Before strang-
ers.

TEACHER'S REPORT, cont.

- (12) What are his relations with other childrentimid
- (13) Is he a leader in play?Yes
- (14) Is he frequently absent from school?No

Was run over by bicycle when 4 and had leg broken.

Case 26.

Age. 12 yrs.

P. or G. Step-father, mother alive and well.

B. Two (a) 17. (B) 16.

S. None.

Class 1A3. Q. (Yes)

W. Before 12 months.

T. very early.

I. Measles, (about 3): whooping cough (about 5), Not operated for Tonsils and Adenoids. Not subject to colds. General health good.

Problem. STUTTERING.

The information was supplied by the mother:

FAMILY HISTORY. The father died as a result of war wounds, soon after the youngest child was born. The step-father is a mason's labourer. There is no family by the second marriage. The elder brother has already been examined at the Clinic in connection with slight delinquency (vide No.). There is no history of stuttering in the family on either the father's or the mother's side and none of William's brothers have shown speech defect or speech disorders of any kind. None of the family have been left-handed. There is no record of nervous disorder in the family.

PERSONAL HISTORY. William had a difficult birth and labour was prolonged. The mother was in good health at the time and William was a well-sized baby. He was breast-fed during the first two weeks of life, but the milk ceased to flow when the mother was allowed to get up. Thereafter, he was a bottle baby. He was not a greedy feeder and in general was neither fractious nor troublesome. He appears to have thriven reasonably well. A comforter was used during the first year at least. He now has a very good appetite and is not fastidious about food. It has not been necessary to take measures to prevent thumb-sucking, but he still sucks his hand while reading and the mother has endeavoured to check/

check this practice. He bites his nails. No trouble has arisen from enuresis and no difficulty either way was experienced in early training in control of the bowel and bladder functions. He has never been left-handed. No disorder appeared in his speech at the outset. The mother thinks that it first manifested itself after he recovered from whooping cough shortly after

he was 5. Sometimes even now, he has no trouble in speaking but there is no definite evidence that the disorder is periodic. When he is excited, and still more, when he is arguing he can speak faster than his brothers. The mother says that he can "give it to them!" William can sing and assume an American accent without stuttering. The only measure that the mother has attempted to make use of in dealing with the speech trouble was suggested by the doctor she consulted in the matter. She has tried to make him take time and to speak slowly. Dr. Mein, to whom she took the boy, told her to try to turn her back to him when he was speaking and to have him go to bed for 4 hours every day. The latter requirement proved to be impracticable. Dr. Wishart suggested that he should sing words beginning with the letter "s" which gives him trouble. There appears to have been a suggestion by his Head-master, Mr. Sim, that he should be transferred to a Special class (Miss Annal's). William went to school at the age of 4½ (Gilmour Place). One teacher, in the early stage of his school career, punished him severely for refusing to speak and said that he refused to do his lessons. At that time, he was a year in advance of his age. Later, he was transferred to Tollcross School, where he passed the Qualifying examination and was held up for 6 months before he was passed on to the Darroch Intermediate School, where he is at present. He is following a Commercial Course. He likes school and is not willing to be absent. He likes school and is taking his work seriously. He used to cry if his work was undone. On such occasions, William would leave the house without breakfast in his distress. This characteristic has appeared in other members of the family, especially the oldest boy. William is now in his first year at the Darroch School. He is scholastically of age. In general, his reports are good. At home, he is fond of reading and will not talk much if books are available. He has not been much punished and it is not suggested that he takes a scolding too seriously to heart. The older boys complain that he is indulgently treated, as being the youngest of the family. He is a rather orderly boy. He goes out quite a lot and has been a member of the Life Boys since he was 10 years old. He is rather shy but not particularly nervous/

nervous with strangers. He is not afraid of the dark and has always gone to bed without a light. He used to have occasional nightmares. About the age of 5 he was knocked down by a motor bicycle, but does not appear to have been hurt at all.

INTERVIEW WITH WILLIAM

In respect of his appearance, it is to be noted that William is smart, bright and quite talkative boy of a highly extraverted type. His lips are not prominent or thickened. He says himself that he stutters only sometimes and that he thinks the speech disorder is now somewhat less troublesome than it used to be. It is at its worst during oral work in class, but he repudiates the suggestion that he was nervous in this situation or with his teachers. He reads, at school, and is not passed over by the teacher in the general work of the class. He likes arithmetic best and weak in spelling. He is not frequently punished for his speech. He went to the Darroch Intermediate School after last summer holidays. He is taking a Commercial Course and would like to be "a clerk or something". His oldest brother is a plumber and the other is at present unemployed. The speech disorder persisted through-out the interview but was never severe during conversation. It takes the form in the main of initial repetitive stuttering, with a tendency to introduce interpolated sounds, such as, O - and er. The following examples indicate the nature and degree of the disorder under the different conditions specified.:

(A) In response to questions.

Age? Tuh-tuh-tw-twelve past

Birthday? I was twelve in March.

School? Da-da-da-Darroch Intermediate School. (nasal expiration at the beginning; no movement but quite audible).

Class? Wuh-wuh-wuh 1A 3 (3 becomes free).

(B) In the reading of isolated words (Burt's Graded Vocabulary 1), the speech disorder manifested itself rather early in the test, even on some of the monosyllables at the beginning e.g. big, pot, girl, boy, terror, tongue, twisted, beware. It should be noted, that in all these cases, the words begin with a stop consonant. As the words grew longer and more difficult, the stuttering increased pari-passu; chiefly because of the appearance of stop consonants within the words. Disturbance of breathing was quite/

quite evident at several points during the test. Examples of words showing the disorder were carry, qu-w- (expiration) - quickly. l-l-labourers (expiration on "l"), fringe, luncheon, (expiration on "l"), eeeeeconomy (pause) ccccontemptuous, sh-sh-shuniversal, d-ttttesting, glycerine, ppp-perpetual, hy- hypocritical, (expiration and complete stop before the word), hhhhautobiography. ph-ph-ph-philosopher.

(C) In the reading of continuous material (Burt's Comprehension 5), the most marked characteristics were the breathing disturbances and the total distortion of the action of the diaphragm. There was some laryngeal spasm and rather frequent interpolation of "k" "ts" and "t" sounds. Expiration might occur at any inopportune moment, with the result that the speech rhythm and phrasing were frequently distorted. Evidence of the breathing difficulty was presented chiefly by the appearance of unnecessary aspirates, e.g. Hon his way out of the t-town he had to pass the prison and has he looked in at the window, whom should he see -----etc.

(D) In reading along with the examiner the speech disorder still persisted slightly.

(E) In reading alone (Five Little Pigs) some slight distortion of rhythm still remained.

(F) Examples of responses during the Herring Revision Test:-

- Test 1.
- (a) M-M-aw it's just about a boy comin' home from fishin' ----et c. (further distortion without stuttering).
 - (b) A-b-bout a young girl. She's got hurt by a motor -----etc.
 - (c) Er-it's - I think it's an office and I think the ~~w~~aman's inquiring (expiration on "q")
 - (d) Hu- there's a woman been cooking and the telephone bell rang etc.-----(I interpolated "aw" before each new phrase) (or clause).
- Test 2.
- (b) t-t-ten and five.
 - (g) tuh-wenty and twenty-six.
3. Er-e-hu-last win- (repeated ten) winter, a hu-large ri-ri-ri-ver over-f-u-losed

its banks. (prolonged expiration at inopportune moments)

Test 4. Little or no trouble during this test except "ssseven-wh-one- 4-5". Even where expiration occurred before utterance, enough air remained in the lungs to make the response possible.

Test 10. (a) Ask somebody the way (no trouble).

(c) Loss of breath before utterance). A-ask him if any other shop sells it that he knows.

(d) Ask for work. (no trouble)

PSYCHOLOGICAL EXAMINATION

Intelligence

(a) Herring Revision Series A I.Q. = 123
 2 A & B I.Q. = 104

(b) Reading Age. (Burt's Graded Vocabulary) = 11.8 E.Q. = 88

(c) Handedness

Writes R Ball R Scissors R Folding R String R.

Dynamometer

R.	21.5	19.5	18
L.	18	15	17

Character & Temperament

Pressey X-O Test.

Test 1 Underlined 31

Circled:- Cinemas, camping, Tennyson, athletic girls, reading, acrobats, banjos, jazz, leaders, games, coffee, typewriting, aviators, Tarzan, revivals, science, sports, travelling, soldiers, books, electricity, chauffeurs, crows, fishing.

Test 2. Underlined 55

Circled:- Smoking, suspicion, ignorance, fibbing, boasting, slang, debt, war, cad, worry, divorce, swearing, butting-in, leaving home, betting, slyness, cunning, greediness, stealing, black-leg, broker, cards, bribery, bragging, tale-telling.

Test 3. Underlined 28.

Circled:- Loneliness, headache, unfairness,

accidents, pain, fire, habits, death, enemies, police, wrecks, reciting, lessons, crowds, movies, teasing, sleep, drowning, blushing, darkness, twitching, dogs, knives, stammering, flightiness.

Scholastic

English (Burt's Northumberland).

	E.A.
Test I	11.9
" II	11.7
" III	10.3
" IV	10.5
" V	13.5

12.2 E.Q. = 94.

Spelling. (Burt's Continuous Graded Test 7).

12.3 E.Q. = 94.

Case 27.

Age. 12 yrs. 2 mths.

P. or G. Both alive and well.

B. Two. (A) aged 17. (B) aged 16 yrs. 6 mths.

S. Two (A) 10 yrs. 6 mths. (b) 5 yrs. 10 mths.

(Class) 1st Year.

Post-Qualifying. Q. (Yes)

Problem. STUTTERING.

Information supplied by mother:-

FAMILY HISTORY:- No members of the family are reported to have been left-handed. There is uncertain information that the father stuttered at one time, but no other cases of speech defect or of disorder are reported. There is no history of nervous stability.

PERSONAL HISTORY. Birth was not unusually difficult, labour continuing over about 10 hours. Chloroform was applied, but instruments were not used. The mother was in good health at the time and not notably nervous during pregnancy. Alexander was a small baby, but his health at the outset was good, and he thrived satisfactorily. He was/

was breast-fed only for the first few weeks of life and then weaned, because the mother was unable to satisfy him. Thereafter he was bottle-fed (cow's milk) until he was 10 months old. Weaning was gradual, bottles being given at gradually lengthening intervals and no trouble appears to have arisen during the period of weaning. His appetite now is good and he is not fastidious.

At no time during infancy was a comforter used. There is no history of thumb-sucking or of nail-biting. There has been no enuresis. He was easily trained in control of the bowel-and bladder-function. Napkins were discarded by the end of the first year. There is no record of constipation or of voluntary retention during or subsequent to infancy.

He has never shown any tendency to prefer his left hand to his right for manipulation.

Recently he has had some trouble with a discharging ear and boils, on account of which he has been absent from school, but the pain has now gone. The boy's speech was satisfactory and showed no trace of stuttering until just before he left Tollcross School about a year ago.

Alex went to school first (Tollcross) at the age of 5 and has never shown any undesirable reaction to the school situation, except that he is perhaps somewhat anxious about his lessons. The mother thinks that his progress at school is reasonably good. He has always liked his teachers.

At home he is a very quiet boy and never gives any trouble. He is quite willing to run the family errands and does not require a note. He reads a great deal in the house, but goes out normally and mixes well with other children. He is on good terms with the younger children in the family. By nature he has always been very orderly and cleanly. He is inclined to withdraw into himself when he has had a scolding. The mother describes him as being nervous, but cannot indicate any specific fears. In general he sleeps well, going to bed ordinarily about 8 o'clock. Occasionally he has had nightmares, and shouts in his sleep. When he was younger he had a night-light by his bed.

There is no record of frights or accidents, in which an immediate cause for the speech disorder might be traced.

INTERVIEW WITH ALEXANDER

Alex's mother was unable on this first occasion to come to the Clinic, as she had to go to school for his small sister. Alex displayed marked nystagmus throughout the interview.
His/

His pupils were dilated and the eyes somewhat dull. He says that he is to have glasses, his eyes having been tested some ten days ago. The right eye is slightly deviated outwards. He was pale, somewhat repressed and rather nervous in appearance during the interview. In manner and in his general attitude to his environment, so far as this appeared, he displayed some feeling of inferiority and lack of confidence.

There is slight facial asymmetry and his lips are full, and the under lip slightly thickened and rather prominent. There is no nail-biting.

Alex went to Darroch Intermediate School in January.

Before that time he had attended Tollcross School. He was about five when he went to school first. He began to stutter only about six months ago and is affected by this disorder only when he is reading or answering questions in class. He stutters in any class. When he has to read at school the teacher has frequently read along with him, but this has not proved to be of much assistance. He is emphatic that he has no trouble at home; but says, referring to his breathing, "often when he is talking to boys he has to draw back". He says that he is nervous when he is talking to the boys, but does not know why.

He can go for messages for his mother without a note and does not stutter in the shops.

He cannot remember of having had a fright at any time and has had no accidents. He says that he never has nightmares or dreams.

He likes school, has never had any trouble, has always liked his teachers and is seldom punished. He is never punished at home. At school he is about the middle of the class. He goes out every night to play. He never fights. At the moment he is a member of no organisations. He was a member of the Life Boys and was transferred recently to the Boys' Brigade, which he left a short time ago. He would now like to go back, but his father seemst to be against this, the only apparent reason being that he wishes to hold the boy to his original decision.

On a hot day last summer Alex fainted on the football field when playing football for Tollcross School. He has since been forbidden football for some time by the doctor.

He has never been left-handed. He does not like stew.
He /

He does not know what he would like to be.

During conversation he sat quietly and there is no noticeable movement during speech. The only obvious disorder of articulation is that in the words "through" and "three". "th" becomes "f". "that" "this" "though" and "them" were all correctly pronounced. The English teacher at Darroch School has tried to correct this, but previously no such attempt had been made. Stuttering on initial letters appeared throughout the interview., being, however, much more pronounced in reading than in conversation or in answers to questions .

The following examples indicate the nature and degree of the disorder under the different conditions specified:

(A) In response to questions:-

NAME? A-a-a-lexander.
 AGE? T-t-twelve past, sir.
 BIRTHDAY? 23rd of February, 1920.
 CLASS? One A free.
 ADDRESS? n-n-number nine, Brandfield Street.
 Brothers? Two; one 17 and the other's six-er-sik-er seventeen come October.

(B) Responses during the Herring Revision Tests.

Test 2. (b). T-t-ten and five.
 (c) S-sixty-four
 (d) F-f-five and seven
 (e) F-four and four

Test 3. Fourteen-fourteen-fourteen-persons were drowned. Other fifty persons - over fifty fifty persons caught colds.

Test 4. Stuttering appeared as in Test 2 on the initial sound of the first number, but not at all thereafter.

Test 10. (1) T-t-t-go to the nearest police station.
 (2) T-t-to ask the teacher to (slight hesitation) to learn you.
 (6) A m-m-man could be a thief or anything like that.

(C) In the reading of isolated words (Burt's Graded Vocabulary): From the beginning stuttering occurred and was maintained throughout on the initial sounds. As the words became longer and less familiar, not only the initial sounds but the first syllable was repeated:

(C) cont. In the early part of the test, er-er-h-his; th-that; g-girl; b-boys; c-c-carry, etc. (In the later part of the test), uni-universal; mel-mel-melancholy; excessive-excessively; gl-gl-gly-cerine; s-s-sh-humanity; pal-palable (palpable); rep-rep-repetition (- reputation).

(D) In the reading of continuous material (Burt's Comprehension 5), stuttering was less marked. It did not increase as the material became more difficult towards the end of the passage. Even some difficulty in pronouncing "Distinguishable" did not affect the speech disorder. The stuttering appeared as before on initial letters; e.g. (1) c-c-c-comfortably; f-f-for the King; bars (with strong tonic lip pressure); (2) on first syllables, e.g., le-le-level lines; wi-wi-william; goo-goo-good morning:- and in the repetition of whole words - whom should he see but-but-William.

(E) In reading along with the examiner, he had little or no trouble.

(F) In reading alone, he had still some trouble (Milne's "Teddy Bear" verse 2): "Stout" "thought" "a-a-anyone" "re-reducing" with marked hesitation.

PSYCHOLOGICAL EXAMINATION

Intelligence

Chronological Age = 12 yrs. 2 mths.

Herring Revision.

Group A	M.A. =	11 yrs. 11 mths.	I.Q. = 98)	} I.Q. = 96.
Groups A & B	M.A. =	11 yrs. 3 mths.	I.Q. = 93)	

Dynamometer

R	11.5	15.5	14.5
L	12	12	12

Ball R. Scissors R String R. Folding R.

Scholastic Achievement

Reading Age (Burt's Graded Vocabulary 1) 12.0
E. Q. = 111.

Character & Temperament

Pressey X-O Test.

- Test I Underlined 60
 Circled - Cinemas, football, Edison, pretty girls, reading, acrobats, banjos, jazz, handsome boys, clothes, pageants, ice-cream, sleeping, actors, Tarzan, church, drawing, sports, farming, soldiers, books, cards, grocers, circuses, racing .
- Test II Underlined 54
 Circled - Begging, laziness, ignorance, recklessness, talking-back, slang, debt, kidnapping, meddling, thoughtlessness, gang, swearing, butting-in, neglect, slyness, cunning, dispute, stealing, strike, bullying, gossip, bribery, dirtiness, tale-telling.
- Test III Underlined 30
 Circled :- Loneliness, sneer, meanness, worry, pain, nervousness, noise, weakness, teachers, dizziness, reciting, lessons, giggling, movies, teasing, sleep, queer-ness, blushing, dreams, crying, wit, disposition, stammering, flightiness.

Scholastic

English (Burt's Northumberland).

	E.A.
Test I	11.9
" II	12.4
" III	16.7
" IV	10.1
" V	13.2

E. A. (English) = 12.9 E.Q. = III
 Spelling (Dictation: Burt's Continuous Graded Test 7).

E.A. = 12.9

E.Q. = III

Case 28.

Age. 9 yrs.

P. or G. Both alive.

B. Five - Four have left home: fifth, aged 12; aged 13; aged 16; aged 21;
 S. Five. (A) in America (B) died at age 3; (C) aged 21;

(D) aged 17; (E) aged 14.

Class. Q. No.

- I. Measles at 8 months; whooping cough at 18 months; scarlet fever slight, 2½ years; pneumonia; and operation 6 years: not operated for adenoids and tonsils.

Problem. STUTTERING.

Information supplied by mother.

FAMILY HISTORY. The father is a labourer, who has been unemployed for 1½ years. Until a short time ago, the mother, both before and after marriage, worked at the Corporation Slaughter Houses. She describes the father who does not stutter, as a sharp man. She herself is now 52 and looks very much older. Robert is the youngest of the family of eleven, all of whom except two and the one who died were at home when he was a baby. All the family, including the father and mother, have had good health. None of them have been left-handed. One older son, William who is now 25, stuttered as a boy. He had an accident at the age of 18 when his chin was pierced by the spike of an iron railing, after which the speech disorder disappeared. He went to America at the age of 19. There are no recorded cases of stuttering amongst the relations of either the father or the mother.

PERSONAL HISTORY Mrs. S - was 43 when Robert was born "a change of life child". He had a natural birth, but the mother was not so well as she had been with the others. For about two months before and after the birth she was not well and had to go to hospital, because of a "clot of blood on the brain". The mother was working until six months before the birth. Robert was breast-fed for 15 months and gradually weaned. The mother describes him as a good-natured child, causing no trouble over feeding - "as good a child as ever I had" but she notes that he had an unusual number of nurses, like older sisters and the brother who is now in America all being interested in the baby, so that from the beginning they made a lot of him. On principle, a comforter was never used. Robert now has a large appetite, and will eat anything that is presented to him. He is fond of soup.

There has been no trouble over-thumb-sucking, nail-biting or enuresis. The mother characterises him during infancy and with reference to training in control of the bowel/

bowel and bladder function as "always a clever child".

He seemed to begin to speak quite normally until he had scarlet fever at 2½. The mother was in hospital at the same time with erysipelas. The stuttering appeared just after that illness. The mother thinks he seemed quiet and cowed when he came out of hospital. There seems to be an implication that he was more strictly dealt with there than has ever been the case at home.

At home he "takes a telling" and is not punished much, though he has had some thrashings. The mother reiterates that he is a mischievous "tricky" child "more tricky for going away than the other children in the family". He is very quick-tempered and when irritated, no matter by whom, comes to blows at once. He is a nervous child, "up to all sorts of tricks and devilment". He has been teased and tormented by the older members of the family, although not about his speech. Like seven other members of the family, he was taken during his early years to the day-nursery in Tolbooth Wynd, while the mother went to work. He always got on well there. Just before starting school proper he went for a short time to the play-centre at the David Kilpatrick School. Thus broken in, he went to school at the age of 5 and has liked it from the beginning. He has never cried or worried about school, and, according to the mother, does his home lessons without appearing to bother about them, before he is allowed to go out to play. There has been no serious trouble at school, until, under his present teacher, he played truant for an afternoon, having been taken away, according to the mother, by an older boy. He goes out to play a great deal, but has "never played with children". He has tended always to play with the older boys who "get him to do tricks". The mother has not always approved of, and has even thrashed him for, the company he keeps, especially that of a boy belonging to the family next door, whom she considers unsatisfactory, - "he is never done fighting" with this boy, chiefly because of teasing. Ordinarily he plays with boys much bigger than himself at the Promenade and he would stay out very late if he were allowed to do so. He has to be brought in every night about 8 p.m. He gets very excited when he has been playing.

On the whole he is obedient at home. Forbidden to go with other boys, he is apt to go away for long walks. He is said to read at home, but conversation with Robert suggests that this can hardly be taken very seriously. He/

He is said to be a very nervous boy, getting very excited when he is teased or scolded at home. He then flushes at once and shakes all over. He talks a lot in his sleep about his play activities. He will not go out in the dark alone, and must always have a light on when he goes to bed. He has been looked after more carefully since his mother stopped work a year and a half ago.

INTERVIEW WITH ROBERT :

His lips are full, thick and prominent. Robert says himself, that he stutters "a wee bit" at home as well as in school, where he stutters when reading. He can answer questions and go for messages for his mother without a note, "except if it is a big message". Some attempt has been made by the teacher to correct his defects of articulation. He likes to go to school. He is a member of no organisations because "he-he-you- must be 10 before you get into the Life Boys". He-takes part in all the more energetic boys' games with the big boys .

At home he is afraid of the dark if he is alone and afraid to be left alone or left alone in a room as he was at the Clinic.

He remembers dreaming (a) about football, (b) about his uncle who is dead, but "is alive up in heaven". "He was a university man and was buried in a gun-carriage".

In reading isolated words (Burt's Graded Vocabulary), the speech disorder did not appear at all, although his reading was bad. It was only slightly more in evidence in reading continuous material (Burt's Comprehension 5, first 8 or 10 lines), initial repetitive stuttering appearing on "person" (prison) "William", "good-morning", "brother", "streame" (= strength).

Throughout this speech disorder was most in evidence in spontaneous conversation and in response to questions, taking the form if a disorder of breathing, seldom appearing in mere repetition of the initial consonant or vowel, and more frequently in the interpolation and repetition of an "er" sound, more often than not aspirated.

For example, during the Herring Revision Tests:-
"er-er-er-he-he-he- the woman's talking to the wee lassie",
er-er-he-he-a woman's phonin'".

In answer to questions he gave his age and address without stuttering and continued "I'll be 10 he-he-next year". His name he gave as Robert ----.

There /

There are some spasmodic arm movements before and during speech when stuttering appears. The stop positions are always liable to be the occasion difficulty, though frequently this is not marked. For example, "calling" is pronounced with glottal cramping at the outset and nodding of the head to assist the effort. Similar phenomena appear before "put it away" and "peephole". There is occasional repetition of words and syllables: e.g. "some-somebody did that".

There are various noticeable defects of articulation apart from the stuttering, the sibilants showing always a tendency towards a lateral lisp "that's easy" becoming almost "that cheasy". While "th" frequently becomes "f", "through" and "three" are pronounced correctly, although with great effort.

PSYCHOLOGICAL EXAMINATION

Intelligence

Chronological Age = 9 yrs. 0 mths

Herring Revision.

Group A	M.A. = 7 yrs. 11 mths.	I.Q. = 86
Groups A & B	M.A. = 8 yrs. 2 mths.	I.Q. = 90

Burt's Graded Vocabulary.

Reading Age = 6.8

Dynamometer.

R.	15	10.5	9
L.	11	8	7

Ball R. String R. Scissors R. Folding R.

Burt's Graded Vocabulary (repeat Test).

Reading Age = 6.6 years.

Mistakes:- "said" for "sad" .. "but" for "pot"; "no" for "now"; "cued" for "carry"; "quiet" for "quickly"; "know" for "known".

Spelling Age = 6.4

tabble for table; clony for only; comeing for coming; scor for sorry; don for done; lessome for lesson; smock for smoke - mounny for money; shock for sugar number for number; brite for bright.

Dictation

Score = 103. Norm. for 6 yrs. 6 mths.

Burt's Binet Test.

M.A. = 6 yrs. 9 mths. I.Q. = 75

Teases the girls because they call him "Daftie", because he stutters. He hits them outside of school.

He hits the boys too when they laugh at him for stuttering.

MEDICAL REPORT

- (1) Height Weight
- (2) Circulatory System:
 Pulse Rate84
- Any abnormality of heart actionNo
- (3) Respiratory System:
 Expansion of Chest1½" full exp. 25¼"
- Any deformity of Chest and its naturePigeon chest.
 Rachetic. operation Emphyema of thorax outside.
- (4) Nose, Throat and Mouth:
- Presence of enlarged Tonsils or AdenoidsTonsil slightly enlarged
- Any structural abnormality of teethirregular. 5 carious.
- Any nasal obstructionNo
- Any structural abnormality of palateNo
- Any structural abnormality of throatNo
- Prominence and thickness of lips or otherwiseNo
- (5) Nervous System:
- State of Pupils:moderately contracted.
- Re-action to lightbrisk
- Presence of deafnessno
- tremorNo

MEDICAL, cont.

- Knee-jerksneither exaggerated nor diminished.
- (6) State of Skin.Slight dampness.
- Speech defect since Scarlet Fever aged 2.

TEACHER'S REPORT

- (1) Average age of class8 $\frac{1}{4}$
- (2) Position in classIn last 3 or 4.
- (3) General quality of workPoor
- (4) General attitude to workCareless
- (5) Does he show any desire to
be near the top of the class?No
- (6) Is he nervous in class?No
- (7) Is he willing to answer questionsExtremely.
- (8) Does he read or recite in class,Has regular
turn in all oral work.
- (9) Does his work show any specific
defect?Dict. V.P. Arith. P. due more
to carelessness than want of know-
ledge. Compos. V.P. no sense in it
- (10) Is he punished frequently?Not often, usually for
annoying other boys.
- (11) Does he always stammer?Always when he is
answering questions. Less when
reading. Seems more fluent with
other children.
- (12) What are his relations with
other children?Aggressive.
Annoys girls.
- (13) Is he a leader in play?No, but often spoils
game by joining in unasked.
- (14) Is he frequently absent from school?No, reg. attend.
311/312.
- (15) Waves his arms when trying to speak. Constantly
fiddles with other children's property. Has more than once
taken small objects from pupils' desks but usually of no
value. Nips or touches pupils passing out to teacher.