gible or moderate decline, decreases in the same marked manner as mortality. Far from the volume of work in the tuberculosis field becoming less, a marked expansion in effort is necessary, with as much emphasis placed on prevention as on treatment. Plans for the detection of tuberculosis must be based overwhelmingly on examination of the household contacts, and it must be a long-term surveillance, especially as our figures of familial contact history would appear to support the theory that inherited susceptibility to tuberculosis is a major factor in the development of disease in the adult.

Summary

The results of an intensive investigation of the sociological and epidemiological features of 125 new cases of pulmonary tuberculosis in North Glasgow are given.

Overcrowding, poverty, and Irish nationality were found not to be significant factors.

The results of x-ray examination of 412 out of 414 household contacts are given with the results of tuberculin-testing of the majority, including adults. A reason for the increased incidence of tuberculosis in older males is suggested.

Figures show that the rehousing of families confers no obvious advantage in preventing the onset of tuberculosis.

The results of contact history examination showed a possible source of infection in a very high percentage, about double those in previous surveys. The contact history was of a familial nature in nearly 90%, and a suggestion was made for the better control of the disease on this basis.

Compulsory x-ray examination of food-trade employees and persons working with children is advocated.

It is a pleasure to thank Dr. A. W. Lees, consultant chest physician, Ruchill Hospital, for his interest and advice in this work, and also our medical, nursing, and clerical colleagues in the public health department.

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"In spite of the very real advances which have been made in the understanding and management of cerebral palsy during the last few years it is still unfortunately true that mitigation and alleviation of the result of the handicap are all that can be offered to-day," states the Annual Report of the British Council for the Welfare of Spastics for 1955-6. To mitigate the sufferings of 30 severely handicapped young adult spastics the Council established Ponds, a home which completed its first year in 1956. Although it would be premature to assess results there, the Warden, Dr. C. D. S. AGASSIZ, believes that practically every spastic admitted has improved socially and physically to some extent. The council regard Ponds as a long-term pioneer experiment to find out what can be achieved with spastics likely to need permanent care, and hope that it may eventually develop into a model on which local authorities may base their own schemes.

DEVELOPMENTAL SPEECH ANOMALIES IN APPARENTLY NORMAL CHILDREN

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The aetiology of speech anomalies in children is often obscure. Particularly is this so when there is no physical handicap, such as cerebral palsy, cleft-palate, or deafness, and when the mental capacity is normal. The indications for treating delayed onset of speech, arrested speech development, and subsequent dyslalia are poorly defined. In view of the scarcity of information in the literature a study of these particular aspects of the problem was planned. On completion of the study, Morley *et al.* (1955) described 72 cases, seen over a six-year period, in which similar disorders of speech were observed.

Material

The cases were selected from children who within the previous five years had attended the medical outpatient department and speech clinics of the Hospital for Sick Children, Great Ormond Street, London. At the outset, 57 children were regarded as physically normal and of average intelligence, though on re-examination doubt was cast on the intelligence in 10 cases. The intelligence quotient (I.Q.) was estimated in seven of these, and two were found to score below 80, the level accepted by MacMeeken (1942) as the lower limit of normality in a study on schoolchildren. These two and the three children whose I.Q. could not be estimated were omitted from the study. Those selected showed no evidence of deafness or neuromuscular abnormality, and it was possible to confirm this by re-examination in 43 of them. Of the children who could not attend this research clinic, further information was obtained by questionnaire in four and the original notes were adequate for some parts of the analysis in 10. In 14 cases where there was some doubt about the effects of the speech abnormality on schooling, a report was obtained from the schoolteacher. Progress reports of five children who had been referred elsewhere for treatment were received from the speech therapists of other clinics. Of the original 57 cases, then, 52 (34 males, 18 females) were included in the analysis.

Normal Speech Development

One or two special points concerning the normal development of speech are worthy of reiteration. It is now generally understood that infants first have a realization of the importance of speech at about 9 months of age (Sheridan, 1945). What is less often appreciated is that the babbling which occurs much earlier (Sheridan, 1945; Schantz-Hansen, 1952; Van Riper, 1954) is of considerable significance and plays an important part in assessing subsequent speech abnormality.

During the course of normal development the child goes through phases of "echolalia," "perseveration," "lispering," and other mild articulatory difficulties. For example, "s," "sh," "th," and "r" are among the last to be learned, along with the tricky consonant combinations such as "pl," "thr," and "sk."

Knowledge of this nature is valuable in estimating the stage at which the development of speech becomes abnormal or arrested. A careful estimation of the child's present and

past accomplishments may indicate fairly accurately the time at which the trouble began. Any unusual influence operative at or just before this time is likely to play an important part in the aetiology of the condition.

It is realized that normal children may show transient "echolalia," "perseveration," "cluttering," "stammering," "dyslalia," and many of the other features detailed below. But when these are related to delayed onset or arrest of speech, or when they persist for months or years, they become an important abnormality.

Incidence of Anomalies

The specific anomalies under review—namely, delayed onset or arrest of speech in late infancy and very early childhood—with their secondary dyslalias, constitute a small group. Unfortunately, the exact incidence is impossible to estimate. Although most practitioners will have seen and themselves advised parents concerning the management of the milder forms of these conditions, there are sufficient severe varieties to constitute 8% (52 out of 610) of all new patients attending this hospital speech clinic.

The sex incidence is approximately 2:1 in favour of the males, the overall ratio of males to females at 1 year being only 1.05:1 (Registrar-General, 1954). This male preponderance has been observed in other speech disorders of childhood, the most striking being that of 5:1 in children with "stammer" (quoted by Nelson, 1954).

Specific Speech Disorders

The first important finding is that arrested development is much commoner than delayed onset of speech. Many children who at first seemed to start sound production late were, on closer questioning, found to have "babbling" at the normal time. Table I shows the age at which "babbling" and word production started. It is unfortunate that

TABLE I.—Age at Which Babbling and Word Production Started

Age of Onset	Male	Female
<i>Babbling</i>		
6-12 months	20	10
Over 1 year or absent ..	4	3
Indefinite	10	5
<i>Words</i>		
Before 18 months	10	5
18-24 months	6	5
Over 2 years	18	8

All except 5 of the above cases had an abnormal degree of dyslalia.

an accurate report concerning babbling could not be obtained in 15 children, but even if these cases were excluded from the lower half of the table the trend is unchanged. It shows that the "late talkers" considerably outnumber the "late babblers." In fact, only 7 out of 37 (52 minus 15 doubtfuls) were late in "babbling," and only these cases can be truly called "late talkers." The remaining 30 "babbled" at a normal age, and of these half showed minimal arrest with subsequent severe dyslalia and half showed arrest for a considerable period with similar sequelae.

The total number of cases is admittedly small, and some parents found it difficult to remember accurately the information required. In spite of this, there is little doubt that in the majority of these children "babbling" occurred normally, yet the correct use of words was delayed long enough for the condition to be regarded as frankly abnormal—that is, until after the age of 2 years (Sheldon, 1955; Morley *et al.*, 1955). A search for the cause of such arrest operating at or after 1 year of age is obviously indicated.

In only five cases could it be said that the late use of words was not ultimately accompanied by some other speech defect. Only one of these five attended the research clinic, and it is likely that if the other four had been seen they too would have been found to have secondary defects. At least it can be said that it is rare for these children to talk normally when they do begin to use recognizable words. It

is therefore obviously unwise to assume, as is so often done, that spontaneous correction will occur in time. These children should be watched with a view to speech therapy when the need becomes apparent.

Multiple dyslalia was found most often, being present in 25 boys and 13 girls (approximately 73% in each sex). The 2:1 ratio of boys to girls was roughly maintained throughout the analysis, so only the totals, in numerical order, will be given. No particular defect was selective for either sex.

General difficulty in consonant formation occurred in 10 children; and specific difficulty with "s" in 11, "t" and/or "th" in nine, "k," "sh," and "r" in seven each, with all other consonants giving trouble on odd occasions. "Cluttering" occurred in five cases, "idioglossia" and "monosyllabism" in four each, "echolalia," "rhinolalia," and "sigmatism" in three each, "multiple 'd' substitution" and "rejection of speech" in two each, and "hysterical mutism" in one case. The common substitutions were as follows: "t" for "k," "d" for "g," "f" for "th," "th" for "s," "s" or "th" for "sh," and "Vw," "l," or "y" for "r."

It is obvious that these children show no fixed pattern of abnormality, though, as might be expected, the last and most difficult of the speech skills to be acquired (the "s," "sh," "th," and "r" sounds) were the most often affected.

In about 16 children the prolonged use of gesticulation was obvious to the mother, though it is difficult for the untrained observer to know what degree of gesticulation is abnormal. In these 16, however, it was obviously excessive and lasted for many months.

Effect on School Work

Of the 32 children who had reached school age and whose scholastic record was obtainable, the progress of 12 (37.5%) was considered to be impeded by the speech defect. Some of these children had received treatment before starting school and yet their dyslalia proved a handicap. This indicates just how difficult a problem it can be in some cases. This figure (37.5%) is probably a fairly true estimate of the problem, as most of the minor cases not seen in hospitals will clear spontaneously before 5 years of age. There are some, however, who are allowed to reach this age untreated, and only when schooling begins is the need for therapy realized. In this series there were several 5-year-old children and one child aged 6 referred for advice for the first time. More significant is the finding that over 40% of the children were referred after reaching the age of 4 years (Table II), thus barely giving the speech therapist

TABLE II.—Age at Which Children First Referred

	2 Years	3 Years	4 or More Years
Males	5	13	16
Females	5	7	6

time to start correcting the defects before schooling begins. The age at which the other children were first seen in hospital is shown in Table II. Although the defect is evident to parents and doctors by the age of 2-3 years, up to three more years may elapse before skilled assistance is sought. A speech therapist accustomed to children can begin treatment in these patients with normal intelligence about the age of 3 years.

Response to Treatment

The intention is not to detail the methods of treatment but rather to indicate its overall value. The results shown in Table III were obtained from this hospital and from

TABLE III.—Response to Treatment

Response	Males	Females
Very good	4	5
Good	9	4
Fair	5	3
Poor	6	1
Unknown or no treatment given	10	5

reports kindly sent from local speech clinics in the London area. It can be seen that in the 37 cases in which accurate information was available 22 (60%) had a "good" or "very good" response to treatment. Some of the remaining cases proved to be severely disturbed psychologically, and in these a combined course of treatment in the department of psychological medicine and the speech clinic is sometimes necessary. A reasonably good prognosis can be given in most cases. If treated early enough, they should be able to start school with little or no handicap, thus avoiding further psychological trauma and possibly ridicule from the other children.

Alternatively, in certain cases, nursery schooling has more to offer than speech therapy (Sheridan, 1945). When psychological factors are operative contact with other children in a new environment may have sufficient influence to obviate the need for formal speech therapy at a later date.

Specific guidance to the mother is invaluable at an early stage. Many of the common mistakes can be avoided, such as threatening, scolding, taunting, or complete neglect of the problem, and the way paved for more specific therapy later. The visits to the clinic themselves allow the child to become accustomed to the hospital surroundings and to the staff—a very necessary preliminary to successful therapy in children whose difficulty is probably psychological.

Aetiology

In the course of detailed questioning more than one possible cause of the speech defect has often been brought to light. It is quite impossible to say which influence is the most important, though it became quite obvious that (as stated by Winnicott, 1931) psychological factors played a major part, and a similar disorder was often reported in other members of the family.

In 33 children there were factors in the environment which could have been operative in causing delay or arrest in speech development. These included seven in which there was obvious mismanagement of the children at home. The family relationships were bad or the parents seemed unsuited to their task of bringing up a family. On six occasions the speech difficulty began at the time of the birth of another child. Additional trouble might have occurred in two of these children, in that they were sent away from home during their mother's confinement. In two further cases separation from home and family for other reasons seemed to be the operative factor. Lack of stimulation, having to "keep the children quiet," or over-protection could account for the trouble in four children. The exact opposite occurred in one case in which the parents pushed a child beyond his capabilities.

It is sometimes said that young children may become bilingual with relative ease. The fact that four children who had lived abroad and travelled were among the cases reviewed would suggest that this is not always so. Whether it was the insecurity of much travelling or actual confusion of language which caused the difficulty it is impossible to say, but the former is suspected.

In five cases the psychological upset was related to trauma, though in only one was there any suspicion that the trauma had caused any relevant physical abnormality.

Seven children were the youngest of large families, and it is well recognized that this may in itself tend to produce abnormalities of speech (Allen, 1950). In a few of these there were some psychological factors in addition. Among the older children there were at least nine cases of "established" nocturnal enuresis. This incidence adds to the supposition that psychological factors were operative in these children.

No cause could be discovered in two children and no cause for an obvious psychological disturbance in a further eight. A more detailed investigation of these families might be helpful.

Many children must be subjected to the above influences and yet not develop a speech defect, and it seems likely that

some other factor determines the development and site of the abnormality. There may be a genetic influence at work, because in 19 cases similar difficulties had occurred in other members of the family. Indeed, 5 out of the 10 children in whom the cause was entirely unknown were of this group. The remaining 5 are a mystery for the present.

All the children who attended the research clinic were tested for crossed laterality. In six the test results were not decisive enough for a laterality index to be made. Twenty-two children were "right laterals," one was a "left lateral," and ten (26%) were "crossed laterals." In view of the fact that in only one child could it be said that crossed laterality was the only discoverable cause for the speech defect, it is most unlikely that this factor plays an important part. Weight is added to this suggestion, by the knowledge that the incidence of crossed laterality (excluding crossing with the ear only) in an average school population was 28% (Pearce, 1953)—very similar to the incidence in this group of children (26%). Again, it has been suggested that children with complete left laterality may have some speech disturbance (Travis, 1933; McAllister, 1937; MacMeeken, 1942; Ford, 1952), but this cannot be an important factor in this group, as there was only one child with this laterality index.

Discussion

Only in recent years has the importance of speech disorders in "normal" children of pre-school age been fully appreciated. The present study indicates that about 80% of such children have arrested development (acquired aphasia) and the remainder have true delayed onset of speech (developmental aphasia or articulatory apraxia) with not infrequent subsequent dyslalia. Developmental dysarthria does not come into this group of "normal late talkers"; a suggested classification of the latter is given in Table IV.

TABLE IV.—*Arrest and Delayed Onset of Speech*

Continuous line signifies probable link. Broken line signifies possible link. N.B.—The 60% of cases responding well to treatment belong mainly to the acquired expressive type, the remaining 40% refractory cases to the developmental types.

The psychological factors detailed above must, we feel, contribute greatly to the cause of these disorders, and others have expressed a similar belief (Winnicott, 1931; McAllister, 1937; Allen, 1950; Nelson, 1954). A family tendency to speech disorders may have some bearing on the outcome of these circumstances, which, it is realized, may have no outward manifestations in many another child. Crossed laterality, although occasionally providing some additional handicap and/or psychological disturbance, does not appear to play an important aetiological part.

Children who understand the spoken word and gesticulate in response to it probably have either "expressive aphasia" or "articulatory apraxia" (Morley *et al.*, 1954), and those who respond in the same way only to signs have "receptive aphasia." Excessive gesticulation was found in 16 children, most of whom had the "expressive" disorder. The presence of gesticulation and of babbling is helpful in assessing intelligence (Illingworth, 1955). Over-attentive siblings and parents help to perpetuate gesticulation and remove the stimulus for speech development.

Schantz-Hansen (1952) has suggested that treatment can profitably be started between 3 and 4 years of age, and we subscribe to this view. By attendance at a nursery school or speech or child guidance clinic, or by simply advising parents, 60% of these children can start school without an impediment. Still further psychological disturbance, such as described by Morley *et al.* (1950) and Ingram and Reid (1956), may thereby be avoided. Morley *et al.* (1955) suggest that the more severe and less responsive cases are due to "delayed neurological development"—a highly selective deficiency. As such cases are not always easy to recognize we believe that all these children should be given treatment in the first instance. If unresponsive, they should be watched so that therapy is given when neurological development is sufficient for benefit to be derived from it.

Conclusions and Summary

The purpose of the present study was to assess the very early development of children with so-called delayed speech and subsequent dyslalia in an attempt to discover possible causes and, in addition, to establish some indications for treatment. These children constitute about 8% of the work of the hospital speech clinic.

The larger proportion (80%) suffer, in fact, from arrested development, probably the result of non-specific psychological factors operating between the age of 1 and 2 years.

In about one-third of all the cases there is a history of other members of the family having similar speech anomalies. This, along with the unequal sex incidence, suggests that a genetically determined factor may also be operative. It may, however, be due to familial living characteristics being copied from one generation to another. Crossed laterality plays little or no part in the production of symptoms.

The specific speech anomalies have been described.

All cases should be given the benefit of a trial period of treatment. In this way many children will start school without handicap. Treatment should not be forced and should at first be on general lines. Attendance at a nursery school may be all that is required in the mild cases. A few of the severe cases, which may be due to delayed specific neurological development, may not respond. These should be reviewed regularly over the period of spontaneous speech development, and treatment for the inevitable sequelae should be given when they can derive benefit from it. Advice to parents and schoolteachers concerning their management is very important.

We wish to thank the Research Committee and the physicians and surgeons of the Hospital for Sick Children, Great Ormond Street, London, for giving their consent to this work and granting access to the case records of these children; to Professor A. A. Moncrieff for his kindly interest and advice; to the department of psychological medicine for the intelligence testing; to the Research Committee for providing funds for patients' travelling expenses, and for the secretarial work kindly performed by Miss Stringer and Miss Lépine. We also thank the schoolteachers and speech therapists who responded to our request for progress reports.

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TREATMENT OF ACUTE APPENDICITIS

BY

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Since the days when appendicectomy became a relatively safe procedure it has been fairly generally taught that the correct treatment of all cases of appendicitis is appendicectomy, and I am told that this is still the current teaching. Nevertheless, for over fifty years surgeons from various parts of the world have written from time to time advocating conservative treatment in some of the more advanced cases.

Twenty-five years ago I began to treat cases of appendix abscess conservatively, and was surprised that most of them resolved without any operative help. Since the introduction of antibiotics I have continued this line of treatment and have usually found that it is not necessary to operate, for most cases settle down.

If with the help of antibiotics the human body could absorb an appendix abscess, I began to wonder whether it was capable of dealing with burst appendices that did not localize. Experiment soon showed that it could.

During the last four years I have asked that every case of acute appendicitis of over 24 hours' duration coming into hospital under me should be treated conservatively. During this period I have had three registrars for periods of about a year who have nobly supported me, and, although doubters at first, have become converted. But I have had, for short periods on two occasions, temporary registrars who did not always fall into line. The results of this policy are the reason for the present communication.

Extending this policy still further, I have conservatively treated a number of cases of acute appendicitis received within 24 hours, and am satisfied that the condition can be safely and certainly dealt with in this manner.

Treatment

The treatment given is rest in bed in any position the patient finds comfortable, nothing of any description by mouth except water, which is given freely, six-hourly injections of penicillin, 250,000 units, and streptomycin; 0.5 g. in severe cases, chloramphenicol, chlortetracycline, tetracycline, or sulphadimidine may be given as well. Pain is relieved by pethidine and/or morphine, but we have found