

## SOME CASES OF EDUCATIONAL BACKWARDNESS IN SINGAPORE SCHOOL CHILDREN

By Freda M. Paul and M. M. Lee

### SYNOPSIS

The word "backward" is usually referred to children who are not keeping up with their age-group in school-work although it may refer to a lag of mental or general development. This article describes 12 cases referred from the school health services and reflects the multitude of cases responsible for educational failure in school children in Singapore. Mental retardation is only one cause of educational backwardness. Other factors include poor social conditions, defects of hearing and vision, perceptual difficulties, emotional difficulties, language lag and lack of stimulation in the environment. Special educational provision becomes necessary in the form of special schools, supportive measures, and remedial teaching if these backward children are to reach their full potential.

The word "backward" is referred to children who are not keeping up with their age-group in school-work, although it may refer to a lag of mental or general development (Gulliford, 1969). Gulliford divided the backwardness according to the degree of mental and educational backwardness.

1. The severely subnormal, where special education is necessary to promote their personal development and social competence.
2. The educationally subnormal group (ESN) who because of limited intelligence required special ESN classes.
3. The slow learners, which form 10% to 15% of children in U.K. considered as slow learners and will need special education in terms of organisation, curriculum and methods of education.
4. The educationally retarded children, who have average or good intelligence but exhibit poor educational achievement. Remedial teaching becomes necessary for this group.

### FACTORS INVOLVED WITH BACKWARD CHILDREN

Gulliford has grouped the factors according to how one should provide help:—

- (a) Children with low intelligence

- (b) Culturally deprived and socially disadvantaged children
- (c) Children with emotional disturbances
- (d) Children with specific learning disabilities
- (e) Children with sensory and physical handicaps

#### (a) Pupils with Low Intelligence

These children with subnormal intelligence should be put in E.S.N. classes in normal schools.

#### (b) Culturally Deprived and Socially Disadvantaged Children

There are many factors in the social environment which will affect the child, particularly unstable family circumstances, lack of funds to enrich the child's scholastic environment at home, vulnerability to delinquency and maladjustment due to stressful circumstances in which these children live. Enriching the environment of these children with good teaching and basic educational skills would improve the abilities of these children in language and thinking.

#### (c) Children with Emotional Disturbances

Gulliford (1969) states that deviations from normal emotional and social development are liable to impede learning by affecting the pupil's motivation and attention.

#### (d) Children with Specific Learning Difficulties

Some children have specific difficulties in learning e.g. marked difficulties in perception and associating what is being learnt. These difficulties may be due to delay in the maturation of specific functions or due to defects of damage to the central nervous system. For such children, remedial teaching is necessary.

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Department of Paediatrics, University of Singapore.  
FREDA M. PAUL, M.D.(S'pore), F.R.C.P.(Edn.), F.R.C.P.(Glas.),  
D.C.H. (London).

Department of Paediatrics, Outram Road General Hospital,  
Singapore.

M. M. LEE, B.Sc. App. Psych. (Hons.), Dip. Psych. (Clin.), U.N.S.W.  
Visiting Clinical Psychologist.

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**(e) Children with Handicaps**

Children with minor degrees of hearing and visual disabilities can be catered for quite well in a normal school. Early detection of minor handicaps means the early introduction of remedial teaching.

Having now considered some of the factors encountered in backward children as outlined above by Gulliford, it would now be possible to apply these factors in children who have been referred from the school health services in Singapore as being educationally backward in school.

**Case 1**

R.Y. was a seven-year old Chinese girl referred by the School Health Service because the child was slow in speech and in her studies, and had failed every year. The obstetrical history revealed that she was delivered by Caesarean section for antepartum haemorrhage and weighed 5 lb. 4 oz. at birth. The child was blue at birth and was in an incubator for nine days. The physical milestones of the child were considerably delayed, and she was only able to walk and talk at 4 years of age. Physical examination revealed a normal looking child with a minimal stiffness of the left side of the body. The height of the child was 3 feet 9½ inches (50th % Hongkong standards for girls of that age) and weighed 42½ lb. (50th % of Hongkong standards for girls, of that age). Her speech was dysarthric. Although she was nine years old, she had no hand dominance. She wrote with her right hand but manipulated blocks exclusively with the left hand. Both hands had poor co-ordination, and her grip was poor. Psychological assessment of the child on the Wechsler Intelligence Scale for children showed that her intelligence level ranged from 71 to 81. On the Bender-Gestalt test her reproductions were at a 5½ year old level, and showed significant indicators of cerebral dysfunction, which was in keeping with her birth history. The tests also showed that the child had very poor visual-motor organisation in that she was unable to reproduce designs, and was unable to anticipate parts into a whole (e.g. assembling a picture of a man). It was, therefore, recommended on physical and psychological assessment that an E.S.N. placement was necessary, and she was referred to a private E.S.N. class run in a church-hall.

**Case 2**

N.K. was a seven-year old girl referred from the School Health Service as being backward in school. This child was under the care of foster parents as the child was an illegitimate baby and nothing was known of the pregnancy. The physical milestones were normal and the child had delayed

speech and started talking at 4½ years of age. On physical examination, she was 33 lb. which was at the 3rd percentile using Hongkong standards for girls of that weight and measured 3 feet 6 inches which was again at the 3rd percentile using the same standards. No abnormality could be detected clinically except for the fact that the child was deaf. An audiogram showed moderate loss at the higher frequencies particularly with the left ear. Her hearing was defective because she would give an answer which was irrelevant to the question. On the performance scale of the WISC she scored within the range of average intelligence (99 to 109) as far as her non-verbal ability was concerned. Her verbal ability was affected by her hearing loss. She was, therefore, given a hearing aid and started on speech therapy. She was next admitted into the Deaf School and settled happily into her work, as she was able to cope with her disability.

**Case 3**

T.L.H. was a seven-year old Chinese female referred by the School Health Service because she was backward at school. There was no history of maternal illness, like rubella. She was a full-term baby delivered normally weighing 5 lb. She was the 4th of 5 children and the rest of the family were normal. She started talking at the age of 1½ years, but her speech was defective. She attended a normal school, but failed all subjects and was automatically promoted to Primary II. On physical examination, she was of average height and weight. No abnormality could be detected in the heart, lungs or abdomen. An audiogram was done by the ear-nose-throat specialist and this showed a 50 decibel loss at 1000 to 6000 frequencies on the right side with a 60 to 80 decibel loss at the 1000 to 3000 frequencies on the left side. On the Wechsler Intelligence Scale for children, her intelligence was normal, with an intelligent quotient of 100. She was fitted with hearing aids and referred to the speech therapist and the situation was explained to the teacher. This was a case of partial deafness causing speech defect and educational failure in a school-child.

**Case 4**

T.G.C. was a nine-year old female child referred by the School Health Service because she was unable to speak well. She was a normal baby at birth and the mother was healthy with no history of German measles during pregnancy. The developmental milestones were quite normal except for delayed and defective speech. On physical examination, the general condition of the child was good, and no abnormality could be detected in the heart, lungs, abdomen or central nervous system. The

child was able to converse but the speech was not clear, as the sounds "ch" and "s" were omitted. No abnormality could be detected on auroscopic examination of the ears. However, an audiogram showed high frequency loss of 40 and 60 decibels at 4000 to 8000 cycles respectively. On the W.I.S.C. her verbal I.Q. was 89 to 99 while her performance I.Q. was 92 to 102. Her full range I.Q. was 90 to 100. On the Bender-Gestalt test her reproductions were at a seven-year old level and showed significant indicators of cerebral dysfunction. On the Schonell Graded Word Spelling Test her age equivalent was below 6 years (chronological age was 9 years) and the Schonell Word Reading Test was 6 year 10 months). The subtest scatter on the W.I.S.C. indicated that the patient's abstract ability was adequate for her age, while her sociability and learned information was somewhat poor. She also appeared to have some visual-motor difficulties. In terms of educational achievements the reading and spelling tests showed that she was achieving below her chronological age. The mother was also pressurising the child at home, as she was an only daughter and had spent much energy on getting her into the present school, and hence she did not want the child to let her down. The child was fitted with a hearing aid and was recommended regular speech therapy; the child's problems were explained to the mother who now understood that the child was not doing well because of specific learning difficulties. Contact and liaison was also made with the school-teacher, as the child was repeating the same class again.

#### Case 5

S.G.A. was an eleven-year old child who was referred by the School Health doctor as backward, having failed all subjects in Primary V. She was a breech baby at birth, born at Kandang Kerbau Hospital and weighed 7½ lb. at birth. The baby was not yellow at birth. The patient had gastro-enteritis at birth, and was admitted into the children's hospital, necessitating intravenous therapy. After this illness, the child had been slow in everything, according to the mother. As a baby she was able to lift her head up at 3 months and sit up at 6 months. She was able to walk and talk at 1½ years. On physical examination the child was 69 lb. which was at the 50th percentile using Hongkong girls' standard for girls of that age and measured 55 inches which is at the 50th percentile using similar standards. No abnormality could be detected in the heart, lungs, abdomen or central nervous system. On psychological examination she was able to relate quite well and express her difficulties in her school-work. On the Wechsler Intelligence Scale for children her full range I.Q. was 81 to

91, her performance I.Q. was 85 to 98 and her verbal I.Q. was 77 to 87. Intellectually she was assessed to be of low average intelligence. There were indications of poor visual-motor co-ordination and a lag in language development. Further assessment on the Illinois Test of Psycho-linguistic Abilities showed her composite psycho-linguistic age to be 8 to 8½ years old level. The test profile indicated weakness in the visual area, that is to say she had poor comprehension of visual stimuli (symbols) and hence was unable to relate, unable to organise and use visual symbols meaningfully. Consequently she had difficulty retaining material learned through visual channels. There was a possibility that the causative factors responsible could be thrombosis of the vessels causing dehydration in gastro-enteritis. The child required remedial teaching to help her weakness in her visual channels.

#### Case 6

H.S.I., aged 9 years 7 months, was referred by the School doctor because she was reported to be constantly chewing her nails and whining in class. She was not making progress in school, and failed the first and second years in the primary class. She was unable to write her name and unable to recognise the alphabet. The mother gave a history of the child being born normally and weighed 7 lb 6 oz but was blue at birth. The child was brought back to her two hours later and the child looked well and both she and the baby were discharged the next day from the maternity hospital. The physical milestones were normal, and according to the mother, the child was intelligent. The patient was the youngest of six children and socialised well with the siblings in her family and with the other children at school. Her poor performance in school was mainly in arithmetic and writing, and she was unable to read. On physical examination, the patient was a pleasant co-operative child weighing 36½ lb, which was average in weight but she measured 3 feet 8 inches which was at the 10th percentile using Hongkong standards for boys of that age. The circumference of the head was 19 inches, which was less than the 3rd percentile using Universal standards. No abnormality could be detected in the heart, lungs and abdomen. No involuntary movements were noted. Stycar free field hearing tests were normal, except for the poor development of the small muscles in her hands. Her nails had been bitten right down to the core. Her writing was both upside down and reversed, and she wrote with the left hand and switched over rapidly to the right hand. She had not developed hand dominance yet. Formal testing on the Minnesota Preschool Scale showed her

non-verbal mental age to be equivalent to 5 years of age, and on the Bender-Gestalt test her reproductions were at a 5-year level with very significant indicators of cerebral dysfunction. However, it was felt that her intellectual functioning was at a much higher potential but that this potential was being impeded by experiencing both manual and verbal difficulties. This, therefore, was a case of dyslexia due to minimal cerebral dysfunction and presented as a behaviour disorder with nail-biting. Remedial teaching was necessary to try and help her with her disability, as she was able to receive stimuli correctly when a task was set but unable to execute the correct response.

#### Case 7

L.L.C. was a eleven-year old female referred by the School Health doctor because she was doing poorly in school. The patient was the 6th of 7 children, and all the other siblings were doing well at school. On physical examination, the general condition of the child was good. Her facies was quite normal, and clinically no abnormality could be detected in any of the systems. Her speech was quite normal, although she remained silent unless she was asked a question. On the Wechsler Intelligence Scale for Children she obtained an intelligence score in the average range. However, the subtests scatter indicated some perceptual difficulties. The home conditions were investigated by the Almoner and were found to be adequate, the family occupying a three-room flat. The rest of the family appeared more intelligent than the child, and two of them were away on scholarship overseas. It was learnt from the mother that the child left the Government school about 3 weeks ago; she had been truanting from school about ten times and the mother decided that she should stop schooling, before she fell into moral danger. The reason she gave for truanting was fear of not being able to cope with her school-work. The child had been hiding herself at the construction site of the Singapore Housing Board Flats and deceiving her parents, till her parents were informed by the school principal. This child had a poor image of being stupid, and this had to be rectified. What this child needed was remedial teaching to help her with her learning difficulties and this was started by allowing her to attend a remedial class at hospital run on a voluntary basis. As she was over-aged for her Primary VI class, attempts were made to enrol her at an adult education class or a vocational school.

#### Case 8

A.S.C. was a seven-year old female child referred by the school health service for facial asymmetry and for being backward in school.

As a baby aged 2 months, the child had suffered from hypoglycaemic fits and bronchopneumonia. She was physically small for her age. She weighed 32½ lb., which was below the 3rd percentile using Hongkong standards for girls of her age, and measured 43½ inches, which was again below the 3rd percentile using the same standards. The circumference of the head was 19 inches, which was below the 2nd percentile using Universal standards. Her facies was odd. She had a squint with a single upper lip crease. The palate was not cleft but the teeth were malformed. There was some dystalia but her speech was intelligible. The other systems were normal. Her visual acuity was not normal, and she was unable to see the blackboard in class. A buccal smear showed the presence of a few cells with chromatin dot and the blood culture of her chromosomes was an XO/XX mosaic Turner's syndrome. On the Wechsler Intelligence Scale for children, her performance I.Q. ranged from 92 to 102. On the Bender-Gastalt test her reproductions were at the 8½ year level, indicating cerebral dysfunction, which could be due to hypoglycaemia affecting the brain at the age of 2 months. She also had difficulty in visual-motor organisation. This child was of normal intelligence but required some remedial help particularly with visual-motor tasks.

#### Case 9

K.O.I. was a seven-year old child referred by the School Health Doctor because she had not spoken a word since entering school. Her main problem, according to the mother, was delayed speech. She was the 3rd child in a family of 6 children. She was a full-term normal baby at birth, weighing 6 lb. Her physical milestones were normal, but she had difficulty with speech. The mother remarked that the child was able to hear. On physical examination, the child was of average height and weight, and her gait was normal. No abnormality could be detected in the heart, chest and central nervous system. Clinical examination of the ears, nose and throat did not reveal any abnormality. Distraction techniques showed she had fairly good hearing on both sides, and she was able to hear both high and low pitched sounds. Intelligence tests showed that on the W.I.S.C. her performance I.Q. ranged from 94 to 104. There was no concrete evidence of perceptual difficulties on both Block Design and Object Assembly Performance. Her ability to imitate certain symbols was poor, suggesting poor associative flexibility when faced with a new learning task. Here was a child with average intelligence, where comprehension was adequate but with considerable lag in speech development. She was started on speech therapy and was able to say single

sentences. The school teacher was notified of her difficulty and she was helping her as much as possible. Remedial help is also indicated in this case.

#### Case 10

C.B.H. was an eight-year old Chinese female referred by the School Health Doctor first on 20.2.67 because she was found to be short for her age on routine examination at school. On physical examination at that time she looked externally like a Turner's syndrome. Her height was 3 feet 7 inches which was below the 3rd percentile using Hongkong standards and she weighed 41 lb which was at 25th percentile using Hongkong standards for her age. There was marked webbing of the neck with prominent carrying angles. The blood pressure was normal, being 100/70 mm. of Hg. No abnormality could be detected in the heart. Although clinically she looked like a Turner's syndrome, the buccal smear showed a positive chromatin dot and the blood culture of the chromosomes showed a normal karyotype. No culture of the skin was done for chromosomes. She could still have been a mosaic Turner's syndrome. She was again referred a second time by the School Health Services at the age of 12 years because she was not doing well in her lessons. On the W.I.S.C. the child showed a verbal I.Q. in the average range while her non-verbal I.Q. was in the superior range of intelligence. The test scatter showed that her arithmetic reasoning and abstract ability were above average, but her verbal I.Q. was depressed by inadequate learned information and poor social ability. An investigation was made by the Social Worker into the home conditions of the child to find out why this child with superior intelligence was doing badly in school, and it was discovered on a home visit that the child's mother died six months previously, and the child being the youngest of 3 children, was closely attached to the mother and was missing the mother considerably. Her father, aged 70 years, was unable to help the child much in her studies and it was arranged for the child's sister, aged 21 years, to help her in her lessons. This was an example where the child's poor achievement at school was due to emotional difficulties, resulting from the death of her mother.

#### Case 11

L.S.C. was an 11-year old child referred by the School Health Services because she was unable to grow and unable to study. Her birth history was quite normal and her physical milestones were normal. She began school about three years ago, and was not making any progress in school. The patient was the 8th child in a family of 9 children. The 9th child was already the height of the patient. The rest of the family were of average height for

Chinese. On physical examination she was dwarfed measuring 3 feet 11 inches which was well below the 3rd percentile using Hongkong standards, and weighed 54 lb which was at the 50th percentile using the same standards. There was minimal webbing of the neck and the nipples were apart. There were prominent carrying angles of the elbows. The blood pressure was 100/60 mm. of Hg. and the external genitalia was female. Clinically she looked like a Turner's syndrome. Her bone age was consistent with her chronological age, and the X-rays of the skull were normal. The buccal smear showed a single dot and double dots and the peripheral blood chromosome culture showed a modal number of 45/47 indicating that she was a mosaic Turner's syndrome. In school she had failed her Primary 6, and the teacher commented that she did not try enough. Intelligence testing showed that her non-verbal ability was bright and normal (range of I.Q. 110 to 120) while her verbal ability was poorer (IQ range 83 to 93). Her main difficulty was lack of stimulation at home, and lack of materials in the form of books or educational equipment, as the child came from a poor family. There was no encouragement or stimulation in the home environment to coax her to study.

#### Case 12

N.b.J. was an 8-year old child referred by the school health doctor because the child was not doing well in her lessons. She was a full-term normal baby, and was born in Malacca and details of the birth history were not known. She was able to walk at 3 years and talk at 5 years. Her speech was limited to 4 words. She had no major illness in childhood. She was the youngest of six children, and was slow compared to other children. On physical examination, she walked with a left hemiplegic gait and the cranial nerves were intact. There was no nystagmus and the muscle power was good with minimal weakness on the left side. The tendon reflexes were brisk and exaggerated on the left side. The plantar response was flexor. Physically she was small and her height was 43½ inches, which was below the 3rd percentile using Hongkong standards, and weighed 37 lb which was on the 25th percentile of Hongkong standards for girls of that age. The circumference of the head was 19 inches, which was below the 3rd percentile using universal standards. The X-rays of the skull did not show any abnormal calcification. On the Minnesota preschool scale the verbal I.Q. equivalent was 61 to 71, and her non-verbal I.Q. equivalent was 73 to 83. The test results indicated that she was of borderline to dull normal intelligence. She spoke a limited amount of English and her speech was im-

mature. There was a mild articulation defect. There was a discrepancy between the verbal and non-verbal ability. This child had a language lag, which required remedial assistance, and the situation was explained to the school-teacher. If the child was unable to cope in a normal school, then placement in an E.S.N. class was being considered.

## DISCUSSION

The above 12 cases referred from the school health services reflect the multitude of causes responsible for educational failure in school-children. Mental retardation is only one cause of educational backwardness as illustrated in Case 1. In 1937 Burt's classic "Backward Child" describes factors like minor ailment, under-nourishment and poverty affecting children. Such social conditions and poor economic conditions prevail in Singapore, and protein-caloric malnutrition is an important contributing factor towards retardation in Singapore. In Singapore Foong (1971) tried to see if there was any relationship between somatic growth (as presented by height and weight) and academic performance in schools as assessed by the results of the Primary VI examination of 1970. He used heights and weights as indirect indices of nutritional status in 1128 examinations of school children. Foong (1971) stated that the low weights of the boys and the poor academic performance could have been due to malnutrition from infancy. Defects of hearing are often undetected at home, and may be detected for the first time when the child goes to school. This was well illustrated in cases of 2, 3 and 4. Hearing loss is often overlooked in schools because the child reacts to sounds, is able to supplement his imperfect hearing by lip-reading, by comprehending situations and following other children. Clues to hearing impairment may be observed when a child fails to do what is told (e.g. Case 2) apparent disobedience, inattention and imperfect articulation (e.g. Case 4). In doubtful cases, audiometric examination must be asked for. Similarly a visual defect can be detected if the child has signs of strain, difficulty with fine movements, difficulty in coping with tasks and these were illustrated in Cases 5 and 8. In recent years there is an increasing interest in the effect of perceptual disabilities (e.g. Cases 6, 7 and 8). Some examples of these are reversal of letters and words, errors in copying shapes and letters and misinterpretation of pictures. Perception is the process whereby impressions coming through the senses are organised and interpreted. Normally we can distinguish between processes of discrimination, e.g. differences are perceived visually between shapes and pictures, and words (e.g. sail and said) or auditory between tones or rhythms or spoken

words (e.g. bill and bell). A word has to be recognised in different print and writing; this, as stated by Gulliford, is a process of analysis when the pattern of words is examined for its constituent parts and process of closure when the parts are put together to form a whole. Children's difficulties in analysing and re-combining spoken words in phonic work are familiar and have been demonstrated by Bruce (1964). Perceptual abilities, therefore, vary according to the sensory channel. Some children have good visual perception but poor auditory discrimination while others with reading disorders are reported to be weak visually, but better in auditory discrimination and memory. Problems may also arise with association difficulties even if the child can hear (e.g. Case 9) or in the link between perception and movement, e.g. visual-motor link when a pattern or word is being copied or the auditory-motor link when the child moved to the rhythm or imitates a succession of words in phonic work (Credall, 1968). Many of these children are intelligent children who were awkward in large small movements, slow in class work, untidy and careless. In visual perception the child must be aware of various spatial relationships. A particular problem of dyslexic children is difficulty with the orientation of shapes e.g. "b", "d", "p", "q", "m", "n" and so on. In this series of children, case 6 had this difficulty which caused her utter frustration, leading to biting of her finger-nails at school-period. Emotional factors also impede progress in school. Case 10 illustrates this point quite well, where death of the mother lead to deterioration of the child's school work although she was superior in intelligence. Emotional disturbances, immaturity, withdrawal, rejection by a group, aggressive behaviour, usually means that the child is unable to participate fully in learning situations. The effects of emotional disturbance appears to show in the low achievement of maladjusted children. Over-protection can be detrimental too. The child who clings to the mother's apron strings lacks independent activity outside the house. Such children are insecure and incompetent in practical activities.

Environmental factors play a very important part in the progress of the child. We are aware of the down-pulling effect of the low social class on the educational achievement at every level. This was well illustrated in cases 7 and 11. Lack of material at home in the form of books and educational equipment will not only affect progress at the preliminary stage but also affects success and studying power in secondary education. If the child comes from a different background at home, or there is restricted use of language then the child

who comes to school will be restricted in language development, (Case No. 12).

As Gulliford states, very little research has been done on the school environment. The method of teaching also affects the progress of a child at school, e.g. child centred methods, the rigid orthodox teaching, the lax method and the streaming methods. Streaming perpetuates and increases differences between pupils.

## CONCLUSIONS

From the above cases, it will be realised that special educational provision becomes necessary in Singapore. The following provisions should be made:-

### 1. Special Schools

These are necessary for the handicaps like blindness, deafness, spasticity and mental defectiveness.

### 2. Supportive Services

A school psychological and a school social service is necessary to enhance the school health services.

### 3. Remedial teaching

Remedial teaching is very necessary and can be viewed as a supplement to, or enrichment of the normal processes of teaching. There are children whose difficulties require teaching with special methods. Such classes should be systematically organised to give continuity of teaching through the age groups. Most schools in U.K. need an extra person to provide additional teaching with individuals in small groups. Some schools in U.K. have a remedial teacher on the staff or get visits from a peripatetic remedial teacher.

### 4. Educational Guidance

One of the pressing needs is early detection of children with special educational needs. Severe physical, sensory and mental disability can be detected in early preschool years, and the responsibility of detecting this lies with the infant welfare

clinic doctor who should assess their development with developmental screening test. Early detection means early treatment. Next there should be integration between the school health services, school psychological service and the school teacher. Teachers observe pupils in a variety of situations and activities over a long period and it would be valuable if their observations could be used more systematically in a procedure which focuses attention on the children in greatest need. There is a need for more teachers who are interested to work with backward children.

In England where education is compulsory, the realisation that some children need special help because of physical, medical or sensory deficiency has been realised, and special schools and classes have been established. In Singapore if these backward children are to realise their full potential, we must organise help in schools on a systematic basis, and it is necessary for school health doctors and teachers to have a basic knowledge of children's problems, and their remedies and for others to have a specialist's knowledge.

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