

The Journal of the Dyslexia Institute Guild Volume 6 Number 1



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DYSLEXIA REVIEW

The Journal of the Dyslexia Institute Guild

Volume 6 Number 1 Summer 1994

Editorial

The first ever *Dyslexia Review* was published exactly twenty five years ago, in April 1969, by the North Surrey Dyslexic Society. It was edited by Wendy Fisher. When the Dyslexia Institute was founded in 1972, the *Review* continued under the auspices of the Institute, and was still edited by Wendy Fisher, who had become the Institute's first Executive Director. The ever-increasing burden of the editorial task was later shared by Dr. Michael Thomson, and together they reluctantly took the decision to suspend publication in the summer of 1982. It was always intended that it should return. Their last editorial promises "a learned journal..... articles on teaching techniques, case histories, as well as experimental work".

It is very fitting that Wendy Fisher and Michael Thomson have contributed to the two major articles in the re-launched *Dyslexia Review.* In view of the twenty fifth anniversary we hope we may be forgiven for looking back; in fact, we welcome the opportunity to pay tribute to those whose pioneering has made possible the work we are all involved in today with dyslexic people.

Looking back through previous issues of *Dyslexia Review*, I have been struck by how much has changed and yet, how little. Twenty five years ago, dyslexia was not widely recognised as an identifiable problem, and indeed, it was difficult to convince many authorities of its very existence. While writing this editorial my attention was drawn to a brief item on a regional television programme: I had not thought to hear again the contention that dyslexia is a middle class problem....a way for the chattering classes to get their children extra, and very expensive, help with reading. Had we come full circle? Did we have to climb that mountain all over again? Most of the broadcast time was, happily, devoted to the Dyslexia Institute London centre and to our friend and supporter, Susan Hampshire. It was borne in to me, however, that there is no room for complacency.

Twenty five years ago the first teacher training course was held in Bath; it lasted for two weeks. However, its aims and objectives were almost identical to those which may be described by any post-graduate diploma course director. We know so much more now, but the children's problems are exactly the same.

Dyslexia Review is about the present and future. I think the key word is LINKS: links between the Dyslexia Institute and its friends and colleagues, links between the Dyslexia Institute Guild and its members, and most importantly links between teachers and other professionals, schools and specialist centres. We hope that you will write to us or use the *Review* as a means of communicating with each other.

We hope that you will find the *Dyslexia Review* interesting, informative, and especially, useful.

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The Review Twelve Years On:

Recent and Future Developments in Dyslexia

MICHAEL THOMSON & BILL WATKINS

INTRODUCTION

It is now twelve years since the last issue of the Dyslexia Review was published in the summer of 1982. One of us (MET) was the co-editor, and it is with great pleasure that we contribute some brief comments on what has happened over the last few years in the dyslexia area. It was also in that summer that we both left our jobs (at Aston University and Grenville College respectively) and came down to Ramsgate to found East Court School.

There has been a great deal of work on the research, teacher training and provision of help for dysiexics since the Review was last published. We propose to outline some of these developments. At the end of this article is a brief bibliography where readers may follow up the details of what we outline.

RECOGNITION

Looking back to 1982, it now seems quite amazing that categories of handicap (dyslexia was not one) defined in 1944 were still in use until the 1981 Education Act. Without doubt, nationally organised pressure groups too numerous to mention here contributed the necessary pressure to raise public awareness to a point where the Department for Education and Science and the Government formulated the 1981 Education Act. Incidentally, this act was not put onto the statute books until 1983. Unfortunately, for many dyslexics the Act came too late to help.

We remember that the 1981 Education Act was welcomed by all who sought to improve the lot of the dyslexic child. Great hopes were raised when specific learning difficulties and dyslexia were officially recognised. Of course, there were still people who resisted the whole concept of dyslexia, but with the powerful Act supporting the perception of dyslexia (specific learning difficulties), this difficulty was soon substantially erased. There were still pockets of resistance, but the mainstream of education was more open to the general concept of dyslexia.

The 1981 Education Act was heralded as a major piece of long overdue educational legislation. Sadly, as many have seen and experienced, it was open to wide range of interpretation.

It requires that after a specific request from parents or school, the Local Education Authority has to undertake various specific tasks, namely:

1. To carry out statutory assessment if the request is considered to be reasonable.

2. After the statutory assessment, it must decide whether the child, in its opinion, has special educational needs.

3. If the answer is "yes", then a further question is asked: "Can the child's special educational needs be met from resources generally available in the school?" If so, the child will be helped from within school. If not, it follows that the LEA must provide extra resources and write a statement.

These three statements appear at first glance to be clear and concise; in fact this is not the case. Indeed, they are open to different interpretations by LEAs and their representatives.

There were many teething problems:

1. The Act opened the floodgates to parental rights and there were not enough educational psychologists to undertake the statutory assessments of children.

2. The assessment of children was initially, in some cases, rather haphazard and did not provide the necessary information to formulate an effective programme of help.

3. The "Statement to meet the child's special educational needs" was open to different perceptions depending on perspective. There was considerable disagreement between LEA's and independent psychologists as to what was appropriate. Broadly speaking, the Act aimed to provide each child with educational facilities appropriate to his or her specific educational requirements.

The Act gave parents clear rights of appeal if, in their opinion, the provision was not met by their LEA The Act and findings could form a basis for High Court action. We have seen many cases reported in the press during the intervening years. In part the 1981 Act set in place two appeals: (1) with the LEA and (2) with the Secretary of State. One of the difficulties associated with the process of statementing was the amount of time it took (approximately eighteen months). Of course, there were occasions when statementing, much to the detriment of the child, took far longer than this.

The 1981 Act clearly gave parents considerable powers and the ability to instigate a request for statementing their child. The LEA had a duty to comply with the request unless, in their opinion, it was "unreasonable". On many occasions parents have been thwarted by the LEA's perception that their child did not require statementing. When this happened, a lengthy and drawn-out confrontational situation often developed with the main loser being the child. Circular 1/83 was succeeded by Circular 2/89. Children who were not sufficiently handicapped to warrant statementing were dealt with within their own school without the strength of the Statementing under Section 7 of the 1981 Education Act. The Act required the school to make provision and meet the need of the child. In addition, in the late 1980s a pronouncement by the High Court indicated that the LEA only had to provide "adequate" education, not the very best. This led to a number of appeals being lost. Often, either through lack of assessment procedure, resources, expertise or staffing, or a combination of all of the above, a situation arose that was little different from what unhappily existed prior to 1983. One of the many difficulties associated with dyslexia is that of the highly intelligent child whose high intelligence masks his/her underlying difficulties so that he/she is perceived as being a child of average ability and no help is forthcoming.

The 1981 Education Act was heralded as an "important charter" for children with special educational needs. Unfortunately, there are still many children who are not being adequately taught: either because their difficulties are not perceived as warranting special statementing or, indeed, attention; or because facilities in many schools are still inadequate. In addition, the recession the late 1980s combined with Government cut-backs in education has stretched already limited resources even further and there are still a siseable number of children whose educational needs are clearly not being adequately met.

1993 saw the publication of the draft code of practice on the identification and assessment of special educational needs, and draft regulations on assessments and statements. The fundamental principles of the code are contained in five separate statements:

1. All pupils having special educational needs throughout their time at school must have these addressed.

2. Children with special educational needs should have access to the National Curriculum as far as possible.

3. The needs of most of the above children will be met in mainstream education without a statutory assessment or statement of special educational needs. Children who are issued with statements of special educational needs should be educated alongside their peers in mainstream schools.

4. Even before the child reaches compulsory school age, special educational needs should receive intervention by LEA or the Health Service.

5. Knowledge, views and experience of parents are vital, and a partnership between parents and other agencies is essential to gain effective assessment and provision.

Practice and procedures are contained in five further statements, and detailed guidance is contained within the draft statement as to how one should follow the five stages contained in the code of practice. Clearly, the 1993 Education Act goes considerably further in defining both assessment and code of practice because it encourages good special needs practice, particularly in mainstream schools. One must remember that the majority of children are within the mainstream sector. A five-stage model is arrived at which is defined below.

Stage 1: Class or subject teacher identifies a child's special educational needs and, consulting the school's SEN coordinator, gathers information and takes initial action.

Stage 2: The school's SEN co-ordinator takes lead responsibility for managing the child's special education provision, working with the child's teachers.

Stage 3: Teachers and SEN co-ordinator are supported by specialists from outside the school.

Stage 4: The LEA considers the need for statutory assessment and, if appropriate, makes a multi-disciplinary assessment.

Stage 5: The LEA considers the necessity for a Statement of special educational needs and, if appropriate, makes a Statement and arranges, monitors and reviews provision.

One of the important constraints of the 1993 Act is time limits for making statutory assessments and Statements. The statement that "it is in the interests of all concerned that statutory assessments and statements are made in a timely manner" can only be applauded. The timetable for the whole process is illustrated and totals 26 weeks in all.

Clearly, the Education Act 1993 is to be welcomed, as it goes a long way towards covering some of the weaknesses contained in the 1981 Act. We view the future with optimism tempered with realism. One of the most encouraging things since 1982 has been the continuing heightened awareness of the general public to the phenomenon of dyslexia. LEAs are providing far greater resources for the training of specialist teachers to help those many children bridge the gap between their underachievement and their potential.

We look forward to the future because our children are our future.

RESEARCH INTO THE ETIOLOGY OF DYSLEXIA

In 1982 research into dyslexia focused on sequential memory and language difficulties, particularly in naming. There was also a good deal of research being undertaken into the neuropsychology of dyslexia. As far as the latter was concerned, this has continued but there has not been very much change in the conclusions. Most researchers agree that dyslexic difficulties have some biological basis, and the left hemisphere of the brain is implicated in some way. Mostly it is assumed that there is some delay in the development of the left hemisphere of the brain specialisation for language, or a deficit in the particular areas which relate to written language in the left hemisphere. Where there has been a major change in emphasis in research has been in the cognitive area. There has been a great deal of interest in the notions of phoneme awareness and phonological coding. Research has homed in on problems in being aware of the sound structure in English and on visual to sound coding in the written language process. Much of this research has taken its starting point from models of the written language process - a typical example of reading is given in Figure 1.



Figure 1: SIMPLIFIED ROUTES IN READING

Two routes to reading are proposed: grapheme to phoneme conversion as outlined in Route A in Fig.1, and directly from visual input to meaning as outlined in Route B. Attention has been focused on the difficulties that dyslexics have in Route A. The dyslexic's problem has thus been seen to be sound coding within the short-term memory system.

Other research has attempted to relate dyslexic problems to the developmental perspective, proposing, for example, various stages of learning to spell. Thus Frith (1985) proposed a

- (1) "logographic or visual sign stage" followed by
- (2) "an alphabetic stage involving grapheme/phoneme correspondence rules" followed by
- (3) "an orthographic stage involving automatic recognition of graphemic clusters".

It is argued that dyslexics have problems in stage (2).

Frith (1992) also proposed a general model of developmental disorders. Figure 2 shows this model developed and adapted as applied to developmental dyslexia (see Thomson 1994).

Within this one can see the notion of biological causes as a basis followed by brain differences. The implication is that there is a common language–processing pathway and the focus of cognitive deficit is a phonological or sound/symbol



Figure 2. MODEL OF DEVELOPMENTAL DISORDERS APPLIED TO DYSLEXIA (Adapted from Frith, January, 1992 Psychologist)

short-term memory difficultly. The result of different experience, maturation, motivation and teaching methods would give rise to the various symptoms shown by dyslexics, and these are outlined in the figure as 'behavioural manifestations'. These are due to core weaknesses in naming, short-term memory for words and letters, and in phoneme segmentation. This model incorporates much of the current focus of attention in research and is a useful perspective.

TEACHING

Teaching since 1982 has changed. Viewed from 1994 it appears that radical changes have taken place, looking through some of our old work-sheets of that vintage (no longer used!), we are reminded that many of them relied on quite formal linear box or 'gap' filling. Of course, the style of presentation has changed quite dramatically over the years, especially with the advent of word processors, desk top publishers etc. Vague memories of returning from the staffroom high on banda fluid after producing 100 cycostyled sheets return! Gestetner printing was another favourite. Photocopying was in its infancy, and expensive. Computers heralded a brave new world which has revolutionised our presentation of work. Word processors, font styles and laser printers have made us all into publishing giants.

The multi-sensory approach has not changed because of the philosophy and practice has proved to be fundamental in solving the puzzle for dyslexic children with regard to their inherent misunderstanding of written language. Like the North Star, the multi-sensory approach holds fast in an otherwise drifting universe. Our experience also clearly leads us

TABLE 1 - EVALUATION OF SPECIFIC TEACHING TECHNIQUES AND SKILLS : SUMMARY OF STUDIES.

Teaching Technique Visual v phonic spelling	Measures Reading and spelling regular and irregular words	Res Dys equ
Syllable analysis	Spelling one, two & three syllable words before and after syllable analysis	Sign (syll
Simultaneous Oral Spelling (SOS) (Multi-sensory)	Spelling regular and irregular words before and after SOS	Sigr insp
Feuerstein Enrichment Programme	Cognitive (visualisation of cubes; block design; similarities); Attainments and focus of attention	No pro
Phonological Skills	Reading regular/irregular words of different frequency; Homophonic confusion	Dys con

to favour an eclectic approach - after all, there is no one "right" way or system that can be used in teaching the dyslexic individual effectively. However, there certainly are wrong ways! We apply the maximum "If it works for the individual on that day, then great - if it doesn't, then put it to one side and try another route". After all, there are many routes to the same objective! Research into language acquisition and structure over the last few years has focused on various models of language. Of particular use has been the idea of teaching structure and analytical perspective to our children. Syllabisation and types of syllable work with children appear to pay dividends. Certainly, we favour this type of approach - principally because it works!

Our fundamental understanding of dyslexia has been influenced by continuing research, indeed we have undertaken research in a number of areas and have adapted and, in some case, changed our teaching as a result of our findings. Value for money is, as always, an important tenet. Because we have such a short time to help our children, every minute of teaching must be seen to be effective. Our overall philosophy is to help our children to overcome their deficit in the most efficient way. To these ends we are constantly reappraising ourselves and our methods.

Asked in 1983 if we were doing our best, we would have given a positive response. In 1993 nothing has changed to alter this perception.

We have been attempting to evaluate some teaching techniques and Table 1 gives a summary of these (see Thomson 1994 for further details), as many of these results have been published elsewhere.

THE FUTURE.

In a sense the future is already with us under the guise of computers, information technology and word processing. We have moved away from the drill and practise methods of the early days of computing to the use of word processing including speech functions. The use, for example, of the latter with Talking Pendown and the Somerset Program are useful aids to the dyslexic, albeit still with slightly 'dalek like' speech.

sults

slexics better at regular word reading when younger. In spelling, ally poor at both, regular spelling improving more rapidly

ificantly better improvement following teaching syllables lable types) against copying training the whole word out

ificantly better spelling for dyslexics using SOS against visual pection; both methods equally effective for non -dyslexic controls

improvement on measure given comparing dyslexics receiving gramme against those not

slexics showed more homophonic confusions than non-dyslexic trols

The advent of multi-media and CD means that it may not be too long before we are able to speak into a microphone and a beautifully word-processed and correctly-spelt piece of writing will come out!

It seems likely that within the next ten years, L.E.A.s as we know them will be a thing of the past, with central government control being the norm. Grant maintained schools appear to be a positive move, with budgetary control in their own hands. Of course we favour, like many, no political interference with education, an immeasurable resource. A certain amount of independence is vital. The replacement of many H.M.I. with Ofsted officers may be seen ultimately as a political move. We do hope not.

Research into causes is ongoing. The BDA Manchester Conference has a healthy number of papers, and the Dyslexia Review has started again! 🚸

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DYSLEXIA

A retrospective view of how knowledge and expertise grew in Britain

WENDY FISHER

I n 1917 Hinshelwood defined dyslexia as a "congenital defect in children with otherwise normal undamaged brains, characterised by a disability in learning to read so great that it is manifestly due to a pathological condition, and where attempts to teach the child by ordinary methods have completely failed". This pronouncement, far from alerting education authorities to look for methods that would work, was ignored.

The Invalid Children's Aid Association first concerned itself with the problem of intelligent children with learning difficulties in the early 60's. In 1962 the ICAA convened a conference on 'Word Blindness or Specific Developmental Dyslexia' addressed by authorities from many countries. The heat and fury generated by parents who attended this meeting led to a resolution recommending the formation of "some kind of parent association".

The ICAA itself determined to raise funds to set up a centre for full assessment for further study. In 1963 the Word Blind Committee under the chairmanship of Dr. White Franklin was formed and Dr. Bannatyne was appointed to conduct research which started with tours of the United States and Denmark. The Word Blind Centre was subsequently established in Coram's Fields and a small but steady stream of children began to arrive for assessment. Mrs. Sandhya Naidoo was appointed Director when Dr. Bannatyne left to take up an appointment in the United States.

In 1966 Dr. MacDonald Critchley widened the definition of dyslexia to include writing and spelling and called it a "language disorder". This definition assisted the development of assessment and, later, teaching.

The ICAA did not forget their resolution to set up and support parent groups. As a parent in the 60's it was not unusual to read articles in the women's pages of newspapers and magazines about a mysterious condition called (usually) 'Word Blindness' but other names, some quite bizarre, were used to describe the condition. But whatever the name, the descriptions were clearly recognisable and the first small parents' groups were formed - all of them looking to the ICAA for comfort and guidance.

In 1970 dyslexia received its first mention in law in the Chronically Sick and Disabled Persons Act. In reality it received little recognition.

The Word Blind Centre was eventually closed in 1971 due to lack of funds and the report, 'Specific Developmental

Dyslexia', by Sandhya Naidoo, was published in 1972. Closing the Word Blind Centre was a bitter blow for the parent associations but the North Surrey Dyslexic Society determined to continue its work.

The Society invited Sandhya Naidoo to chair a working party to discuss the possibility of a replacement for the Centre. The working party included Kathleen Hickey, retired Head Teacher of a Surrey remedial centre, Betty Adams a retired Surrey Schools Inspector, Dr. Graham Curtis Jenkins, who had taken great interest in dyslexia and saw many children in his surgery, Bryan Corrie, a lawyer who drew up all the legal papers and Mike Meiklejohn, then Chairman of NSDS. I was the secretary and fund raiser and I was also responsible for publicity and publications.

Within a year, after meeting regularly, the Committee produced a complete set of rules and procedures for the proposed 'Dyslexia Institute'. The opportunity to start work came in 1972 when a room was offered for teaching at the Gypsy Hill College of Education. The offer was seized and Kathleen Hickey started to teach six children for two afternoons a week using the structured multi-sensory language training which had been pioneered in America. A teacher, Jean Augur, who later became Education Director of the BDA, was recruited for training and a psychologist, Neville Adams, was retained for assessments.

All this time the administration and finances of the Institute were in the hands of the North Surrey Dyslexic Society. The Society agreed that their primary role as a voluntary pressure group did not serve the best interests of the Institute whose professionalism was paramount. In 1973 therefore the NSDS relinquished control to a newly established Council of Management.

The Institute did however consider publicity important and to this end sent questionnaires to independent schools asking what provision they made for dyslexic pupils. The first questionnaire produced about a 25% response, the following year about 60% and then about 85%. This enterprise together with the *Dyslexia Review* helped to spread information about dyslexia and the Dyslexia Institute to schools and associations.

Publicity of course resulted in new parent associations being set up all over the country. Some of these cast envious eyes at the Institute in Staines and the first to make an approach was Sheffield. Within a year three teachers were trained, premises were found and a Sheffield Institute opened. This pattern of invitation, teacher training and fund raising for opening costs, was soon established and it was not long before a network of Institutes with their teaching outposts and parent support groups were flourishing all over the country.

While independent schools could take a relaxed - even interested - view of our work, the state sector took a very different one and the hostility we received was widespread, typified perhaps by an article in *Remedial Education* which referred to a "creeping sickness" in North Surrey where dyslexia was a contagious hysteria rampant amongst the middle class parents of disappointing children. But by 1975 the Institute was sufficiently established to be invited by the D.E.S. to submit a report to the Committee on Special Education which later led to the Warnock Report. The Dyslexia Institute's submission, largely the work of Betty Adams and written under her chairmanship of the Council, still makes fascinating reading for its clarity of purpose and the evidence it submits.

The Warnock Report, published in 1978, recommended that categories of need should be abolished and that all children with "learning difficulties" should be regarded as having "special needs" for which schools should make proper provision. This new concept of special education was accepted by the 1981 Education Act, which became law on 1st April 1983, and it effectively broadened state responsibility for special education from about 2% of the school population to an estimated 20%. The Act stated that a child has "special needs" if he "suffers from a disability which either prevents or hinders him from making use of educational facilities of a kind generally provided in schools". This clearly included dyslexia as we understood it. If adequate provision was now to be made for dyslexic children it was important to increase public and teacher awareness.

The first Dyslexia Institute Week was held in 1982, with a press conference, open days at Institutes nationwide and the first of a series of signed book 'Orcshuns' which attracted the attention of the literary world. In October 1983 the first major international conference was organised by the Dyslexia Institute at Stratford-upon-Avon. Speakers included Dr. Albert Galaburda from Harvard Medical School, Professor David Crystal, Professor Paula Menyuk, Dr. Marion Annett, Dr. Alan Baddeley, Dr. Jim Stevenson, Dr. John Stein, Professor Coltheart, Dr. Margaret Newton, Dr. Audrey Wisbey and Dr. Harry Chasty.

The Dyslexia Institute had entered a new phase of its development.

I retired in 1985 and over the past eight years I have followed the institute's development with great interest. It is gratifying for me to know that since our foundation we have helped to unlock the potential for the 20,000 children and adults whom we have taught, that we have trained 1,500 specialist teachers who are now out working in schools, that we have given educational assessments and advice to over 70,000 people and that we have delivered hundreds of awareness courses, lectures and workshops to teachers, parents and other interested professionals. These are the targets we set ourselves in 1970. \checkmark

Wendy Fisher was Executive Director of The Dyslexia Institute from 1972 to 1985. She is currently a Vice-President of the Institute and a trustee of its Bursary Fund.

THE ORTON DYSLEXIA SOCIETY CONFERENCE 1993

Liz Brooks

F rom November 3rd - 6th 1993 the 44th Orton Dyslexia Society (ODS) Conference was held in New Orleans. It was a stimulating four days.

It is impossible, in this article, to review the work of the 269 speakers at the Conference. Consequently I have selected the presentations of a few key speakers to summarise the most recent neurobiological and developmental research and thinking; these are the areas which are much in advance of the work in the UK.

Brain research is being significantly boosted in the period 1990 - 2000, which is designated the 'Decade of the Brain' in the USA. By the turn of the century we will come to understand the working of the living brain very much more clearly than we do now.

A brief historical review of dyslexia research in the 20th century reminds us of how expertise in assessment and teaching of specific learning difficulties is only now beginning to be underpinned with understanding of how the brain works. This understanding is helping to establish dyslexia as a real, not a 'middle-class', disorder.

In 1925 Samuel Orton observed a young patient who was failing to learn to read. Indeed, Orton pointed out that this patient was suffering from the same condition that in 1917 Dr. Hinshelwood, the English neurologist, had described as 'a congenital defect in children with otherwise normal undamaged brains, characterised by a disability in learning to read...'

Hinshelwood's description of 'Congenital Word-blindness'

and Orton's own observations spurred him to obtain funding from the Rockefeller Foundation and in 1926 he began a two year project to study children with reading difficulties. His aims were to devise remedial methods and study the physiology of the brain using animals.

He was very successful with his first aim but it was always a sadness to Orton that he failed to make greater progress with the physiological research, since he had concluded that dyslexia was caused by an unusual pattern of cerebral dominance and that the difference was neurologically rather than psychologically based.

Twenty years after Orton's death, in 1968, Drake was the first person to notice the difference in the anatomy of a dyslexic brain. Ten years later the first studies on the brain of a childhood dyslexic were carried out by Galaburda and Kemper at the Boston City Hospital Pathology Department, a hospital at which Orton had worked early in his career.

In 1980 the Orton Dyslexia Society began to support the neuro-anatomical laboratory at Beth Israel Hospital, Boston, where post-mortem studies of dyslexic brains was to be carried out by Norman Geschwind and Albert Galaburda of the Harvard Medical School. Much of the research and thinking reported in this article draws on the findings of the work conducted here and owes its link with ODS to Drake D. Duane who was President of the Society from 1976 to 1980.

GENERAL SUMMARY OF THE CURRENT POSITION

In his paper to ODS, DR DRAKE DUANE, Director, Institute for Developmental Behavioural Neurology, Arizona State University, gave a thorough survey of research, showing how the development of the central nervous system is influenced by genetic and non-genetic processes. The resulting difficulties can create disabilities in both spoken and written language, arithmetic, mechanisms of attention, non-verbal learning, memory, personality and coordination.

Duane described how the work begun under Geschwind, whom he described as "the father of behavioural neurology", has developed at Beth Israel Hospital.

Different parts of the central nervous system and the interrelationship of different disorders are the focus of a wide range of current research. For example Pauline Filipek at Harvard Medical School, Massachusetts General Hospital, is considering the sizes and relative sizes of the upper temporal lobes in the two hemispheres of the brain. At Yale University School of Medicine, Bennett Shaywitz is studying the shape and size of the corpus callosum which connects the two hemispheres.

Since work began at Harvard Medical School there have been rapid technological advances in neuro-imaging and scanning techniques. These are enabling study of the brain in action. As a result various researchers are advancing theories on the role of different parts of the brain in efforts to establish where disruption to normal learning takes place. The cerebellum, basal ganglia, transient visual system and auditory systems are areas receiving particular attention.

The most important genetic research has been, and is being, conducted by:

- JOHN DE FRIES at the University of Colorado, using twins in the Colorado Reading Project.
- HERBERT LUBS at the University of Miami School of Medicine, where his work on genetic and brain behaviour and the use of neuro-imaging have led him to believe that dyslexia is predominantly inherited.
- SHELLEY SMITH at Boystown, who is working on linkage studies. Chromosomes 6 and 15 have been the focus of most of the research but chromosome 15 is no longer a tenable theory.

Hypotheses for non-genetic but biological causes of dyslexia have been put forward by Geschwind and Galaburda and include:

- a different amount of testosterone being released in the developing foetus in utero.
- immune-antibodies conveyed from the mother in utero.
- factors or events present around the time of birth.

Some current research is involved with the recently recognised Attention Deficit Hyperactivity Disorder (ADHD). Duane described attention as "the final common property of the intact nervous system". He described the key components of ADHD as being present before the age of seven.

Work on ADHD has led to the use of drugs to assist in learning - in particular Ritalin which makes the pupil more alert and normalises the metabolic rate in the brain. 10mg of Ritalin has worked in 92% of cases. More recently the drug Piracetam, which is currently used most effectively for enhancing memory in Alzheimer's disease, has been used with dyslexic children, particularly in the USA. Ritalin is used sparingly in the UK and Piracetam is not yet an accepted drug here. In the USA doctors are reporting good results from the use of both these drugs.

DR. ALBERT GALABURDA, Director of the Dyslexia Laboratory, Harvard Medical Studies, Beth Israel Hospital, presented data to show that mechanisms involved in processing information in parallel and in stages in the brain are altered in dyslexia. His well known work of post mortem sectioning ten dyslexic brains (seven male and three female) have led him to note that all the males have ectopias, clusters of cells which are out of place, in the cortex of the brain where cognitive activity takes place.



Figure 1. Galaburda''s Overview of the Brain and its ability to Read

Recently Galaburda's attention has turned to perception. He described perception as "the gateway to cognition – particularly in babies" and explained that although it becomes less important later, if it fails to work effectively disruption to the learning of language is likely to result. The conclusion he is currently drawing is that "the cortex of the brain is rendered abnormal by the perceptual aspects of the system". Galaburda considers that magnocellular weaknesses in the visual system are experienced before meaning is attached, that is very early in the visual processing procedure, and that this is of little significance other than slowing down the process.

Galaburda hopes to see more research into the auditory system, where he sees anomalies in its early development for fast processing of information. These anomalies may be similar to those described in the transient visual system by Margaret Livingstone, and may account for auditory perceptual difficulties in dyslexia.

DR. GORDON SHERMAN, Assistant Professor at Harvard Medical School and successor to Galaburda as Director of the Dyslexia project at Beth Israel Hospital, delivered two fascinating lectures. He summarised diagnosis of dyslexia as involving:

- functional/behavioural effects
- aetiological factors (mechanisms)
- biological correlates which include: neuro-cortical ectopias, the auditory system (in the cortex of the brain) the visual system (the magnocellular system)
- and auto-immunity and left-handedness which seem to be increased, but whose involvement is questionable.

He described the three types of biological difference which have appeared in dyslexic brains:

Firstly, there is greater symmetry between the two hemispheres, with the normally smaller right hemisphere larger than usual. An increased number of neurons are probably involved and the inter-hemispheric connections are more restricted. Research shows that these differences occur early in the life of the developing foetus. Secondly, defects in the magnocellular fast processing aspect of the visual system have been found which accord with the findings of Livingstone et al 1991 and Lehmkuhle 1993. Magnocells in the lateral geniculate area have neurons that are 27% smaller than normal. The magnocellular system is very important because it affects stability in reading and distinction in other systems. Sherman speculates that in the auditory system phonological problems result and in the motor system as yet unconnected effects may be found.

Thirdly, focal abnormalities have been found in the cerebral cortex of the brain where cognitive ability is controlled. Ectopias have been referred to earlier. These result from a problem in neuronal migration in the first 20 weeks of gestation. Up to 102 ectopias have been found in a dyslexic brain although only a few of these are in the right hemisphere. In the 'normal' brains used for comparison a maximum of two ectopias was found.



Figure 2. Diagrams of the left and right hemispheres of the brain to show the position of ectopias in a dyslexic brain.

There are interesting differences between male and female brains. There is no sign of ectopias in female brains although there is sign of neuronal loss and it takes place after neuronal migration to the cortex. In males, Sherman theorises, some vascular disturbance early on causes damage to a blood vessel that leads neurons to build up round the damage and thus an ectopia is formed. Where this happens the external limiting membrane is breached and current research is looking at why this happens.

Sherman believes that one recessive gene causes the problem and that the 'trigger' could be testosterone, but he points out that hostile foetal environment, viruses, toxins, drugs, maternal anti-bodies and chance, all have their part to play.

In his studies on New Zealand black mice, a species in which ectopias are present in 40% of cases, he has found a variety of neuro-peptides in the ectopias and these affect behaviour. He has also found that the mice with ectopias learn more slowly than those without. However, if the environment is enriched and remediation takes place, the problems that are experienced can be almost obliterated.



Figure 3. Sherman's medical/educational model: "Better definition/diagnosis is important because it leads to better targeted remediation".

DR. BRUCE PENNINGTON, Professor of Psychology at the University of Denver, is conducting a longitudinal study which ends in 1994, with the aim of combining family risk and spoken language behaviour and identifying those at risk and remediating them early.

For the study he used:

- genetic research in collaboration with John De Fries and Shelley Smith which shows that a dyslexic parent has a 35 - 40% chance of bearing a dyslexic child;
- neurological research in collaboration with Albert Galaburda;
- MRI scans;
- neuro-cognitive activities, including phonological tasks;
- behavioural analysis;
- and exploration of phenotype boundaries, in particular, to what extent dyslexia linked with Attention Deficit Disorder (ADD).

The study has involved two groups of pre-school children, one group from families with no history of dyslexia and the other from families where dyslexia is present.

Three categories of tests were administered to these two groups over two years

Psycho-social	1. 2.	DICA ADD task Harter's Self Esteem & Depression Scales
IQ	1. 2. 3.	WPPSI Letter identification Single word reading
Phonological	1. 2. 3. 4.	Phoneme perception task Rapid automatic naming Words - real - rhyming - phonic Phoneme awareness
In the second	yea	r Woodcock-Johnson tests were added.

Pennington found that the high risk group results were different from the norms, because they showed much greater weakness in phoneme awareness measures and this suggests that the mechanisms underlying the two groups are different. The differences were less obvious in the first year of testing, although in both years 'the Initial Consonant Different' and Bryant and Bradley rhyming tasks were more problematic for the 'at risk' group. In year two the 'at risk' group had more difficulty with blending and phoneme awareness but there was no significant difference between the two groups, in either year, on verbal short term memory or phoneme perception tasks.

Bruce Pennington puts forward two theories as a result of his study: firstly that phonological awareness predicts reading skill and that reading ability then affects phonological awareness and secondly that there is a causal relationship between psycho-social correlates and dyslexia, ADD depression etc. To learn more about the latter we must await his written paper on the research.

DR. GEORGE HYND is Research Professor of Special Education and Psychology and Director of the School of Professional Studies, University of Georgia; Clinical Professor of Neurology, and Director of the Centre for Clinical and Developmental Neuropsychology, Medical College of Georgia.

In his two papers, Hynd explored the relationship between ADD and dyslexia, and how neuro-imaging techniques can assist in observing brain-behaviour relations in dyslexia.

Hynd believes that there is likely to be a link between ADD without hyperactivity, and dyslexia. He has noted that both ADD and dyslexic children show symmetry in the brain and believes that the genetics could produce a wide variety of syndromes: "A child with a single disorder is the exception rather than the rule - there is normally a cluster of disorders." Hynd reported that most studies using neuro-imaging techniques show that the whole brain is involved in reading but that as reading becomes more fluent, less of the brain is used more efficiently.

DR. MARCUS RAICHLE, Professor of Neurology and Radiology, Washington University Medical School, delivered the Norman Geschwind Memorial Lecture on the subject of functional imaging studies of single word processing in the brain of normal readers.

This fascinating presentation traced the development of the use of technology from X-ray Computed Tomography (CT) to Magnetic Resource Imaging (MRI) to Positron Emission Tomography (PET). PET is not used with children because for them it increases the chance of cancer, but with adults it records the distribution of activity in the brain.

When a word is new to someone there is much more activity in the brain than when it has been learned. Dr. Raichle theorises that the way the brain goes about all activities may be the same, initially conscious and then

Figure 4. Raichle's images of the brain in action. The lighter areas indicate the shifting blood flow in the brain when it is concentrating on different tasks.



HEARING WORDS



SEEING WORDS



SPEAKING WORDS



GENERATING WORDS

fully automatic. His hypothesis is that the brain shifts from a non-automatic circuit when learning to an automatic circuit when the activity is learnt and that the whole information processing shifts to the back of the brain and becomes visual in single word recognition.



Figure 5. Raichle's hypothesis that the brain has pathways which are concerned with learning (A) and other pathways which are used when the skill becomes automatic (B).

Dr. Raichle is particularly interested in the role of the cerebellum, which normally controls muscular and tongue control in the mouth. In word reading he noted considerable activity at the back right lower side of the cerebellum and he believes that this area has something to do with guiding the language process. He did not expect the cerebellum to be involved in a cognitive process and thought that this finding may be critical in understanding how the brain works.

In later discussion with Dr. Sherman, I discovered that there is evidence of peculiarities in the cerebellum of dyslexic brains and that research is to begin on ectopias in the cerebellum soon.

DR. BYRON ROURKE, Professor of Psychology, University of Windsor, Ontario, Canada, delivered a paper on Non-verbal Learning Disabilities (NLD). He put forward the theory that there are different types of dyslexics and that there are two routes to their disabilities:

- poor linguistic skills
- poor visuo/spatial skills

Those with poor linguistic skills have problems with phoneme awareness but are good on visual-perceptual skills. They almost certainly have auditory perceptual difficulties, which affect auditory attention, auditory memory and consequently phonology. This group is likely to have difficulties with arithmetic, but not other sections of mathematics, and they will tend to have the visual skills which lead them to become surgeons, architects, engineers etc.

Those with poor visuo/spatial skills have NLD, that is they have problems with visual/spatial/conceptual tasks. This group experience particular difficulties with tactile perception, visual perception, visual/spatial/analysis skills, and complex psychomotor co-ordination tasks. They also have trouble with mathematics.

Children with NLD will learn to read but the quality of understanding what they are reading is at risk.

Parents report that these children fail to explore, that they are clumsy and run into people and objects, that they are accident prone and tend not to anticipate, that they do not pay attention and are frequently diagnosed as having ADD which leads to the administration of drugs, such as Ritalin, particularly in the USA.

In considering the neurology of this syndrome, Dr. Rourke pointed out that the fewer fibres you have in the corpus callosum of the brain the greater the chance that your visuo/spatial skills will be good.

Non-verbal Learning Difficulties are not categorised as such in the U.K. at present, but a teacher or parent can recognise the groups described by Dr. Rourke. NLD may be an area which we hear much more about in the future.

SUMMARY OF CONFERENCE

It has been difficult to select and summarise the new thinking and complex research, based very much on medical knowledge, in the USA. The striking factor for me on my first visit to an Orton Conference was the different perception of dyslexia and other learning difficulties in our two continents. In Britain I believe that teaching and learning methods have been developed well and in many ways are now in advance of the USA. In America the extent of medical and other research is breathtaking and fascinating.

The main conclusions I drew from the conference were that:

- Multi-sensory teaching involving phonological awareness and development of perceptual ability should start as young as possible; during the time when the brain is maximally plastic, which is up to seven years. This is particularly important if there is a history of dyslexia in the family.
- Much practice of skills is essential since the MRI studies show that less of the brain is used more efficiently when a skill has been practised and learned. This may take longer for a dyslexic but is very important in helping him to master his difficulties with learning.

- The effects of differences in magnocells in the visual system have not yet been fully established and that similar research on the auditory system will be of interest and importance.
- Behaviour could be affected by the neuro-peptides in ectopias and disturbances in connections of the 'neural wiring' in dyslexic brains; therefore an open mind on the *limited* use of drugs, in particular for attention disorders, should be maintained.
- Careful assessment/diagnosis of the type/types of difficulty e.g. non-verbal learning disability is essential for effective targeted remediation.

Neuro-biological, neuro-psychological and developmental research is confirming the appropriacy of our current assessment and teaching techniques, many of which were pioneered by Orton. New knowledge is helping educators to focus their work. Dr. Samuel T. Orton would be heartened to see the progress being made.

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Liz Brooks is Executive Director of The Dyslexia Institute.

AUDIO CASSETTE TEACHING MATERIALS

JEAN WALKER

T eachers and parents of dyslexic students have for a long time recognised that the dyslexic child does not learn to read and spell by plodding through a series of workcards in the corner of the classroom. The dyslexic needs to learn in a multisensory way, combining visual, auditory and kinaesthetic channels. So teaching systems with at least a two channel input would seem to be a better solution. Audio tapes with accompanying written material seem to offer a handy structured package for a busy teacher to use in the classroom, or for the uncertain parent to use at home.

THRASS, The Handwriting Reading and Spelling System

THRASS is a neat package containing two tapes, an eight page teacher's book and four A3 work sheets, including a Word Spelling Copy Book and Sound Spelling Copy Book. Only an ordinary cassette tape recorder is required.

The pupil and teacher work through the Word Spelling Copy Book with the tape. It covers the alphabet, the days, months and seasons, as well as 'left right' and seven 'polite' words: please, thank you, sorry etc. Emphasis is on learning through tracing the words in print script, naming the letters. A further 148 words are to be learnt in this way and these embody all the spelling choices in English. The Sound-Spelling Copy Book consists of drawings of 46 boxes. Each box contains all the spelling choices for one particular sound up to ten choices in one case.

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lanuary February Marcl		Tr th wr	ye dge
left-right SPRIN	t tt ed	th th	S SS Se
bot bubble cot key luck	sq	- the second sec	e wwł
ga egg guess hal who pig pepper road larry rhubarb		ai au a	VOWCL SO
toe fiftle kicked thin wi at paper ate wait s	e ea ee ey u	eq eig	h air
maire lea straat manay happy har airate word nurse earth	er ir or ur o	ear eer er	e ire
foot push food ruite bl	ow oil log	r ieeyy	- Omitive

The learner is expected to learn these by tracing and visualisation. Those who survive the soporific experience of listening to 148 separate sounds, intoned one after another on the tape, are then allowed to go on to joined writing, at a very late stage of learning.

The rationale behind the system is not explained. Alan Davies' cleverness is in condensing the spelling choices in English all on to one sheet. The consequently large amount of information contained in this small pack makes it extremely indigestible. No concession is made to the child with difficulties in memory and learning. There is no acknowledgement, in the visual presentation of material, that pattern and analogy are important in our recognition of words. There is little attempt to motivate, or even to instruct. The system merely has the learner jumping

through neatly arranged hoops. Not even the adult helpers are told why they are doing it.

It is clever, inexpensive, and I suspect is gathering dust on the shelves of many a dyslexic's frustrated and disappointed family.

The Handwriting Reading and Spelling System Alan Davies, Writetrack ISBN 0 95 15662 7 X





This consists of a series of books, the first three of which have been published. Each one is accompanied by a tape which gives the student instructions for each exercise. An ordinary cassette tape recorder is required, and also a blank tape for the learner to record his own voice.

The co-authors are two teachers and a speech therapist. The scheme is designed to take the pupils progressively from the very first stages of letter recognition to full literacy, based on structured multisensory methods. Each letter is accompanied by a reading and spelling card, and the pages of the book contain separate exercises to give step-by-step practice in word and sentence reading, tracing and spelling words, and noting word patterns, syllable division etc. The student is asked to make tapes of his/her own voice to produce self dictation exercises.

By the end of the third book, each individual letter of the alphabet has been taught as well as common digraphs such as sh, ch and th. Syllable division and suffixing, including the doubling rule, are tackled.

The system has been most carefully thought out and broken into simple steps. The voice on the tape is pleasing and uses very clear pronunciation.

The front cover of the book states that the scheme can be used with the "minimal of supervision". But a helper would be needed to ensure the necessary multisensory practice which the book suggests.

For a trained specialist teacher, or a parent who frequently observes his or her child's specialist multi-sensory lesson, there is much material here that may be of value. It would provide useful reinforcement practice at home which some dyslexic children need. The materials would seem to be most suitable for the fairly bright 8-11 year old dyslexic pupil.

The Beat Dyslexia Activity Pack,

Celia Stone, Elizabeth Franks & Myra Nicholson. Distributors: Beat Dyslexia,Toft Trees, Apperley Lane, Bradford BD10 ONS.

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ARROW System and Tapes



These books and tapes follow on from Dr. Lane's earlier successful work on ARROW with pupils with various kinds of learning difficulties. It uses the principle of 'self-voice echo', combined with reading and writing to provide multisensory learning.

The system is designed to be used with a twin-track tape recorder. There are four books and accompanying tapes, covering basic letter-sound links, high-frequency words and word-families. These are presented in isolation, in a group of words and then in sentences. The system Listen, Read, Speak, Listen to the Self-Voice and Write is employed each time, so no instructions are given on the tape. A further ten graded topic books contain graded reading passages (from Reading Age six years to 12+). Dr. Lane's voice is slow and steady, with clear enunciation and natural intonation when reading sentences or poetry.

The word-families are listed in alphabetical order, so that a particular letter-group could be chosen and practised when needed. Dr. Lane has demonstrated good gains using the method. The materials and system are plain and effective. Intensive bursts of 15 minutes per day over a period of four to six weeks are recommended for the optimum benefit. The materials are suitable for use with children or adults.

ARROW tapes and scripts are available only to those who have taken a short course of training session with Dr. Lane.

ARROW teaching material, Dr. Colin Lane The Arrow Trust, The Priory Annex, St. Mary Street, Bridgwater, Somerset, TA6 3EL





Units of Sound is available for use with a twin-track tape recorder, or an ordinary cassette recorder. This programme consists of three books and accompanying tapes, a teacher's book, and record and screening sheets. The three stages cover the development of reading and spelling skills, from very simple c-v-c words to complex multisyllabic words. The system is linear and progressive, highly structured and organised. It begins at a reading age of five and finishes at a reading age of $12\frac{1}{2}$ years. A screening test helps a teacher to place a student at the correct starting point, and record sheets are filled in for/by each student. For each page, the student listens to the tape using a twintrack tape recorder, and records each word before the recorded voice if possible. Words are arranged on the page in short numbered columns, according to a pattern of sound. Oral questions are given to ensure that the student understands the vocabulary he is reading. Sentences and paragraphs increase in length and complexity as the reading age rises. There are also frequent built-in checking pages, in the form of passages which the student is required to read, then spell as dictation.

Students on this system can observe their own progress clearly as they go page by page through the stages. The teacher's book is detailed, but best results are obtained if teachers receive training in its use. Although Units of Sound is a comprehensive system for giving structured reading and spelling practice, it is most effective when used by a teacher who can give careful input in between, to keep motivation high.

Units of Sound, Walter Bramley

Available from: The Dyslexia Institute, 133 Gresham Road, Staines, Middlesex TW18 2AJ. Telephone: 0784 463851. STARS, Structured Taped Approach to Reading and Spelling



STARS is a set of scripts, accompanied by 117 tapes, that can be used ideally on a twin-track tape recorder, but also on an ordinary cassette recorder. STARS is an acronym for Structured Taped Approach to Reading and Spelling. It is part of a suite of developing materials to accompany the structured letter order of the Dyslexia Institute Literacy Programme (DILP) which is currently in use **only in Dyslexia Institute centres**.

The tapes and scripts are similar in format to Units of Sound, but the progression follows the teaching points of the standard letter order of the DILP. The aim is to provide self-checking work in reading and spelling for each stage in the structured programme, to ensure adequate practice and consolidation.

Each script consists of words and sentences on a particular teaching point. 'Quiz questions' are asked to make sure that the student is reading for meaning. Sentences are in structure, employ natural speech patterns and use only the letters, constructions and high frequency words that have already been taught. Teachers said that the pilot version proved to be a useful and enjoyable part of the lesson for students.

The materials are suitable for all ages of student from about seven years and above.

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Jean Walker is Training Principal for The Dyslexia Institute in the North of England and Scotland and is Coordinator of teaching materials development.

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DYSLEXIA AT THE ROYAL SOCIETY

MARTIN TURNER

There are conferences and conferences. And there are the f L academic equivalents of intimate planetaria. Early on the 22nd October 1993 I ventured sceptically from the underground tunnels below Trafalgar Square (official notices are designed both to inform and mislead) and headed up the Duke of York Steps to the august portals of the Royal Society. These have gazed impassively upon the passage of centuries since the days when the Society, though the butt of Jonathan Swift's satire (at the Grand Academy of Lagado, visited by Gulliver, one professor had sought for eight years to extract the sunbeams from cucumbers), numbered among its members Swift's cousin, Dryden. The Society's founder and patron, Charles II, a suitably frivolous choice from a satirist's point of view, now gazed down in portrait upon a hall which, had a bomb dropped upon it in the latter stages of the day, would have lamented the loss of the flower and much of the youth of British cognitive science.

Gone are the days when a veneer of starch-collared medical repute served as a fig-leaf for the largely craft tradition of dyslexia teaching. Gone too, it seems, are the days when the totalitarian frown of local education authorities could freeze indefinitely the problems of dyslexia in definition and circumlocution ("specific learning difficulties"). Now the sport of science has become both deadly serious and high fashion: will the phonological processing school repel the assault from the vision factorists? Will analogy sweep away the logographic stage? Does auditory perception make you more intelligent (and by implication the lack of it less so)? Will a bullish 'movement memory' plunge out of a calm sea and, bearing away multisensory teaching, Europa-like, on his back, sunder forever his loyalties to Orton's transatlantic story of clashing hemispheres?

If any gathering was going to advance such questions, this one was. Hardly a name from our bibliographies was absent. Dr Uta Frith (MRC, London) did not participate beyond a pointed question or two but sat through the day in the audience, as did Dr Usha Goswami (Cambridge). Dr Jane Oakhill (Sussex), Spearman medallist and leading student of comprehension processes, was also in attendance. The day's sponsor, the Rodin Academy for the Study of Dyslexia, had as conference organiser and presenter Professor John Stein of Oxford. The tilt towards physiology (as critics perceive it) of the Rodin Academy was confirmed by the presence (absence, as it turned out) of Professor Colin Blakemore, also of Oxford and star of the small screen. Chris Brand of Edinburgh University was also unavoidably absent. The theme for the day, Mental Speed and Reading, was politely ignored by most contributors but its interest and importance will ensure that it serves as a spur for colloquia to come.

After some slides of blue sky and sea intended to induce a friendly set towards the University of Wollongong, Australia, if not to boost recruitment at this notable centre of excellence, Bill Lovegrove launched into an account of metacontrast functions. His research had included attentiondeficit disordered (ADD) and learning disabled (LD), as well as normal children. A backward masking methodology helped him to investigate the relative timing of the transient and sustained visual systems. A shift of saccade triggers the transient system, which in turn inhibits the sustained system. LD children showed a reduced metacontrast function, relative to controls; "most ADD children read normally"; but children with both ADD and LD are more delayed in their responses. "Not all poor readers are the same"; reading cannot itself be a cause of delayed transient function, hence there "is no causal relationship".

Next Peter Cornelissen of Oxford described in considerable detail, enhanced by slides, the physical functioning of the magnocellular (M) and parvocellular (P) systems, the two visual pathways whose timing, first investigated by Lovegrove, has recently proved a candidate for a major theory of dyslexia (Livingstone et al., 1991). Cornelissen pointed out that there is "an awful lot of crosstalk" between the systems, because of "great connection density" throughout the cortex. However M input may be important for the dorsal stream (where things are), P input for the ventral stream (what things are). 30 LD children showed less contrast sensitivity at low luminance but not at normal luminance (daylight). It was hard, therefore, to see a causal role in poor reading. In another study, however (n = 25, n)CA match), dyslexics, both adults and children, were somewhat poorer at detecting movement, needing 3-4% more optical coherence to detect movement.

The visual section of the morning continued with Alan Kennedy's analysis of saccade structure (launch, land, refix), informed by the many typists at Dundee University who complain of discomfort after long hours staring into WP monitors. Kennedy was followed by Mr I. Levy of the London Hospital, who, after arriving late and in haste from visiting a patient, displayed an impressive theoretical grasp of the hemianopias (loss of part of the visual field, leading for instance to a pupil omitting the ends of lines) with clinical data achieved apparently with little in the way of expensive machinery.

Those wishing to evaluate the revival of vision processing factors in reading disabilities will want to consult the

recently published authoritative compilation by Dale Willows and others (Willows et al., 1993).

Before lunch Phil Seymour of Dundee illustrated his caseaggregate studies in relation to poor readers able, or less well able, to read nonwords. (This field has been recently reviewed in Rack, Snowling and Olson, 1992.) Seymour is known for his format distortion studies which showed that letter-order, rather than visual gestalt (zigzag), influences word recognition. He has now analyzed the major variables (word/nonword, high/low frequency, regular/irregular spelling) and concluded that one group of cases has trouble reading real words (morphemic dyslexia) while another group has trouble reading nonwords (phonological dyslexia). The case series approach allows for individual heterogeneity. Some pupils show problems with 'low level visual processes' in analytic tasks. Seymour ventured to investigate, also, certain effects associated with teaching.

His colleague Rhona Johnston from St Andrews followed, rotating like juggling balls the constant variables of phonological similarity effect, word length effect, rehearsal rate and memory span. Johnston feels she has established that poor readers and their reading age match controls do not differ on measures of phonological memory; she takes this as her starting point. Subjects in her studies, she reported, may not have benefited from rehearsal even when taught it.

Ian Deary of Edinburgh crisply expounded his rather startling study (soon to be published: Deary, 1994, perhaps) of inspection time. (Inspection here means, counteretymologically, auditory inspection.) There is typically a correlation between reaction-time and IQ of 0.4-0.5. But does mental speed lead to intelligence or the other way round? Having got hardware to do massive numerical analyses, psychologists have been awaiting software to resolve the paradoxes of causality for them. Cross-lagged panel analysis proves inferior, because of the error associated with initial correlations, to structural equation modelling. (At lunch Deary and Hulme traded the notations of connoisseurs on the SEM software.) 104 Edinburgh children aged 11 were given 120 trials each on inspection time, together with measures of verbal and non-verbal IQ (Mill Hill and Raven, this being Edinburgh). The measures were repeated two years later, and the correlations analysed, and, behold, auditory inspection time had "some bearing on" Mill Hill verbal IQ!

Before lunch Lynette Bradley, source beloved of Dyslexia Institute essayists writing on 'difficulties with spoken as well as written language', described how she has become a remedial consultant for Oxford University students! No, this was not grist to the mill of Professor Dummett, indicting the grammatical impoverishment of even the most successful students of today. Bradley's students typically complained of slow reading, expressive difficulties in writing, poor spelling and failure to reflect in writing their full verbal abilities. Bradley mentioned the scant literature on dyslexia in adults but referred to the work, unknown to me, of Barbara Felton in the US, who was able to discriminate between LD and control subjects by the use of tests of rapid naming, phonological awareness and nonword reading. In addition, Bradley mentioned, she has experimented with the National Adult Reading Test, the Neale, Schonell (reading and spelling), the Boder Reading/Spelling test and Digit Symbol from the WAIS-R. A group of 22 LD students had made 12.59 errors (mean) on the Schonell spelling test, compared with a mean of 2.56 for 52 controls. (The latter level of spelling she took as reflecting not unfavourably upon the spelling abilities of Oxford students.) More anecdotally Bradley had tried to teach LD students and found some of them incoherent; written exam questions might need to be read seven times. Comprehension problems, too, were rife.

After a lunch in which tidbits were assembled on delicate plates with glass-holders, while still more appetizing conversations buzzed round about, Charles Hulme of York University boldly simplified some of the complexities of the morning by declaring that reduced speech rates were by themselves quite sufficient to explain both poorer memory span and poor reading among 69 CA and RA matched individuals with a spread of RAs from five to 14. Short-term memory dropped out as a predictor of reading ability in stepwise linear regression. Measures of phonological processing however (oddity task, phoneme deletion) still made an independent contribution.

The severity of this bold theoretical demarche was continued immediately thereafter by Maggie Snowling of Newcastle University with a "severity hypothesis": the severity of the phonological processing difficulties determines qualitative individual differences. To illustrate differences between surface and phonological dyslexics, she described two pairs of subjects (referred to in subsequent moments disconcertingly as "groups") and their performance on tasks involving nonword reading, nonword repetition and rhyme production. Differences observed reflected severity of impairment, which in turn depended upon "the integrity of the underlying phonological representations".

Adverting to the theme of the day, speed of processing, Rod Nicholson and Angela Fawcett of Sheffield gave again their duet performance of their data-rich study of dyslexics poorly automatised in motor skills relative to RA- and CA-matched controls at all ages. Not only did they get through their whole series of studies, familiar recently to those who attended the Dyslexia Institute's birthday conference at Easter 1993 at Royal Holloway College, but they managed to unveil, in its considerable glory, their Cerebellar Hypothesis.

After tea Harry Chasty returned, through his own WISC-III UK data, to the possibility of psychometrically-defined dyslexia subtypes. John Marshall described in laborious detail an Italian child whose excellent coding skills (reading and spelling, a simpler matter in Italian) coexisted with an IQ of 50; this boy was followed by one in the vicinity of Oxford, classically dyslexic, with an IQ of 136. This was intended, and received, as a huge joke. Thereupon a "practitioner" emphasis took over, obviously as the lighter end of a seesaw still otherwise weighted by the morning's physiology. With whatever firmness theoretical knots had in the meantime been tied, the end of the day saw an irretrievable decline into loose threads of every kind. The kindly authority of the chairman was, however, steeled by the invincible rules of the Royal Society which required an end to discussion and instant dismissal onto the streets. Outside those portals the stars of the tranquil planetarium were unceremoniously but perhaps only temporarily eclipsed by the garish glare of the London night.

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STREAMLINING RAVEN

MARTIN TURNER

R aven's Matrices seem to be the world's longest and most widely established tests of intelligence. No special training is associated with their administration, so non-psychologists can and do use them.

The family of Raven's tests (Raven, 1938-65) comprises three sets of "progressive matrices" tests, allied to two measures of vocabulary, Crichton and Mill Hill (respectively for primary and primary/secondary populations). In practice this permits rapid and reliable estimation of the two main groups of human intellectual abilities, verbal and non-verbal; accordingly efforts have been made to provide contemporary normative values for users when opportunities have arisen (Turner, 1978).

Normative data have accrued on them for every conceivable population. There are Navaho and Slovak norms, norms from Puerto Rico and Sao Paulo. Ethnic differences in performance have become apparent, for instance in New Zealand between groups of European, Maori and Pacific Islander origin. This is a sensitive matter. I recently met, in exile in London, a young Chinese psychologist of Tatar origin who had collected Standard Progressive Matrices (SPM) data on different ethnic groups in Western China which showed a superiority for Tatars! Naively he had deposited these data with his supervisor. They were suppressed and locked in a filing cabinet, while he was suspended from his university appointment and forced to flee the country. (Research and opinion on "the IQ controversy" have been sensitively and responsibly surveyed and assessed in Snyderman and Rothman, 1988.)

Because of their age, the Matrices tests have given an unparalleled vantage on the rise over time of international standards of intelligence. Discussing this, Raven and Court, citing Flynn (1987), comment: "The rate of increase is such that if norms derived from a sample of our own generation were applied to our grandparents, only 1% would score above our mean" (Raven and Court, 1989:30). Nutritional factors are normally credited with this phenomenon.

THE TESTS

Carroll (1993:212) describes the general set to which these tasks belong as follows: "...the stimulus material is presented in the form of square or triangular matrices, and in this sense these tasks are extensions of multiple exemplars tasks. The material may be literal, numerical, semantic or figural. The subject must notice the order in which materials are arranged in the matrix, or the trends or systematic changes in stimulus characteristics that take place over the rows and columns of the matrix."

Inspired by Spearman's work (1927), the Matrix tests were originally intended as a measure of Spearman's g, that is, the higher-order general factor in intelligence present across a range of tests. But what do they measure? It is generally accepted that at a lower level they measure a factor of inductive reasoning. (A factor is a mathematically derived hypothetical entity responsible for co-variation of subjects across tests. If a computer were fed the measurements of a multitude of boxes of different sizes, it would conclude, though it would not name them, that there were three factors: length, breadth and height.) Most factor analyses show that the variables employed in the task correspond to four (or more) factors, together with a higher-order general factor, such as g. Besides inductive reasoning, there appear to be components of spatial ability and speed. In their extensive analysis of this test, Carpenter, Just and Shell (1990:404; cited in Carroll, op. cit., p. 696) conclude however that "the processes that distinguish among individuals are primarily the ability to induce abstract relations and the ability dynamically to manage a large set of problem-solving goals in working *memory*" (emphasis added).

An important caveat, therefore, is that the Raven's Matrices tests may discriminate unfairly against dyslexics, a large group with frequently demonstrated problems in working memory. Indeed, variants of the Matrices tests sometimes appear to behave in an unexplained diagnostic fashion (Turner, 1994). Further, there may be systematic effects favouring males over females, at least in an adult college population: it has been found that "Males answered significantly more Raven problems correctly. Males perform significantly better than females on this test. Such findings call into question the use of Raven as a measure of g" (Cunningham, Stanovich and Wilson, 1990:141).

TECHNICAL STANDARDS

Older tests, such as those of the Raven and Wechsler families, must face the criticism that progress in psychometric methodology makes inevitable. Most obviously, in the case of the Raven tests, there is their inefficiency. Additional items do not readily bring reliability: as a rule of thumb, if reliability is to be doubled, the number of items must be quadrupled. No test constructor nowadays would need 60 items, as in SPM, to achieve a measure of non-verbal reasoning. The Matrices scale in the British Ability Scales (Elliott, 1983) measures this ability through the age range 5:0-17:11 with only 28 items. Nor are the individual Raven items arranged in any order: five scales (A-E) each have 12 items, which roughly ascend in difficulty. Accordingly there is no point at which a failing pupil, in an individual administration, can discontinue. Typically, an administration, individual or group, may take an hour.

One important advance, commonly used in the construction of new tests or revision of older ones, has been Rasch scaling (e.g. Andrich, 1989). This model assumes (and selects only items that fit) a simple interaction between ability and difficulty. A Rasch scale allows interval measurement, in which (say) the difference between 20-30 is no different from that between 70-80. Although Rasch methodology, and item response theory generally, are usually combined with traditional item statistics and test construction methods, the result is economy, efficiency and objectivity.

A REARRANGEMENT OF RAVEN'S MATRICES ITEMS

In Research Supplement No. 4 for the Raven tests there is an analysis by Andrich and Dawes (1989) of all the Matrices items. A table of equivalences is given for Coloured Progressive (CPM) and Standard Progressive items. Data from 847 Iowa school children and 484 adults enabled an analysis of item difficulties to be made simultaneously for SPM and Advanced Progressive Matrices (APM). Not surprisingly, it turns out that there is considerable overlap in difficulty between the two sets: of altogether 60 SPM and 36 APM (set B) items, seven APM items fall below the mid-point of difficulty, 19 SPM fall above (Andrich and Dawes, op. cit., p. 25).

However most users will want to deploy the two tests separately; the APM remains the best individual test of non-

verbal reasoning in adults, though the "estimated norms" for ages above 20 are thinly spread, do not discriminate within the upper 5% of the ability range and are somewhat old.

For children aged 6:6 to 15:6, there is now the opportunity to administer, in a fraction of the time and with minimum loss of reliability, a shortened form of SPM, using sub-sets of items selected according to the Andrich and Dawes analysis of item difficulty values. This can be done with half (30) the items or even with a third (20), by selecting every second or third item from Andrich and Dawes' ranked list. Moreover, item selection can avoid repetition of the same items, in effect creating parallel forms. Because items can be administered in ascending order of difficulty, the test administration can be discontinued after six consecutive failures, with low probability of any omitted items being within the subject's problem-solving range. The totals (30 or 20) can be multiplied (by two or three respectively) and the result looked up in the most recent and relevant table of norms supplied in the manual (1979 British Columbian and British norms "smoothed"). Similarly a small set of 12 APM items given in order of difficulty can, multiplied by 3, be compared with adult norms provided in the manual.

SUGGESTED ITEM SELECTIONS

For SPM, the following selection of items, in the following order, is suggested for a 30-item version of the test (item numbers of correct answers are given in brackets): B1 (2), A3 (1), A1 (4), B2 (6), D1 (3), A9 (1), C2 (2), A10 (3), D5 (8), D3 (3), C5 (7), B10 (3), D4 (7), D6 (6), C4 (8), B11 (4), C6 (4), B8 (6), B7 (5), E1 (7), D9 (1), C8 (1), E5 (1), B12 (5), E6 (5), C11 (1), E9 (3), C12 (5), E12 (5), E11 (4). For a shorter, 20-item version of the test, which will take no more than a few minutes to administer and whose use will be as a simple screen, the following selection of items, in the following order, is suggested: A4 (2), A1 (4), C1 (8), A9 (1), A7 (6), D5 (8), D2 (4), B10 (3), C7 (5), C4 (8), D8 (4), B8 (6), D10 (2), D9 (1), A12 (5), B12 (5), E7 (1), E9 (3), E10 (2), E11 (4).

Adults of average or above ability necessarily require more complex stimulus items. Raven gives norms for a "power" (timed) administration (to measure "efficiency") of APM, with 40 minutes being given for 36 items. A short, screener version of this test is particularly useful. 12 items can be given in 13' 20", preserving the principle of the time limit, if not the fatiguing effect of 36 complex items. The following selection of items, in the following order, is suggested (item numbers of correct answers again in brackets): 2 (1), 11 (5), 7 (6), 14 (1), 12 (6), 23 (6), 22 (7), 20 (8), 31 (4), 35 (3), 34 (1), 29 (6).

APM and the Mill Hill vocabulary test exist in short, 12-item sets for even more rudimentary screening. These eliminate only the extremes of any putative distribution. Nevertheless, there are no tests of serviceable quality with adult norms which can be used by non-psychologists; even instruments for psychologists are of a date and technical quality which leave much to be desired.



Empirical evidence of correlation between long and short forms of SPM

In the Autumn of 1991, 29 subjects were given all 60 items of Raven's Standard Progressive Matrices. Three of the sample were adults. Of those for whom information was available, nine were male, nine female. The mean age of the 14 children whose ages were recorded was 11.5 years (SD = 2.6 years). The results were analysed for [1] the whole test; [2] the 30-item version, using the item selection given above; and [3] the 20-item version using the item selection given above. The good agreement can be seen in Figure 1 which displays all the data obtained. Correlations, though not estimates of reliability using standard formulae, are a good indication of how closely the two shortened tests approximate to the full version. The 30-item version produces a product-moment correlation of r = 0.975; the 20item version one of 0.952. Both suggest an acceptable level of approximation to the result given by the full version.

CONCLUSION

Teachers are frequently asked to make assessments of individuals, both to determine the likelihood of the presence of a specific learning difficulty and to give an orientation for any specialist teaching that may be required. Old and inefficient tests must sometimes be used, for lack of availability of anything better.

Nevertheless Raven's Standard and Advanced Progressive Matrices, if shortened in accordance with item difficulty values obtained through recent empirical analysis, remain useful tests and are of acceptable validity and internal consistency. Such short versions are of use primarily as a screen, to give a benchmark level of an individual's non-verbal inductive reasoning with which other abilities may be compared, and represent a great saving of a professional's scarce time. References

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I n April 1969, Mrs. Wendy Fisher edited and published the first *Dyslexia Review*. This was the first regular publication in Britain on dyslexia and emerged from the determination of a group of parents of dyslexic children in the North Surrey Dyslexic Society to "stimulate further study and lead both parents and teachers to reflect on their respective responsibilities at home and in the classroom."

By the time the last issue, Vol. 5. No. 1, was published in 1982, *Dyslexia Review* had grown to become the recognised publication in which all those interested in dyslexia wished to appear. Enquiries about the journal still come from Britain and around the world.

The contents of the first issue monitored the work of the Word Blind Centre, the Bath Association for the Study of Dyslexia, the problem for parents and teachers, learning to read and books for dyslexic children. It also contained a report on the first Easter Teacher Training Course in England, arranged by the Bath Association (1969).

A practical approach to education based upon sound research was the philosophy that made Wendy Fisher's impact on provision for dyslexic people in Britain so vital.

Not only did she launch and edit *Dyslexia Review* but with vision, drive and determination she went on to establish The Dyslexia Institute (DI) in 1972, where she remained as Executive Director until she retired in 1985. Fortunately she still remains a Vice-President of the Institute and a trustee of our Bursary Fund.

Wendy Fisher's effective voluntary contribution to the dyslexia movement in Britain deserves much greater recognition. It was she who masterminded the DI's integrated development of assessment, teaching and the training of teachers across the country. It was she who worked tirelessly to raise funds from trusts and fund-raising events to support this development. It was she who harnessed Members of Parliament in both Houses to support our work and who enlisted Susan Hampshire to aid the awareness of dyslexia; bringing publicity on every possible occasion. It was she who circulated schools with a questionnaire on dyslexia, who contributed to the reports before the 1981 Act and it was she who appointed first, Kathleen Hickey, and later Dr. Harry Chasty, as Directors of Studies of the Institute.

Those of us who were privileged to work under Wendy Fisher's leadership have affection and enormous respect for her. Some of us have memories of her that make us quake in our shoes!

Recently I have spent time reviewing the Institute's archives, *Dyslexia Review* and Press Cutting books. The further I delve, the more my respect grows. Did Wendy's training as an architect make her a visionary? Did the struggle her daughter, Sophy, experience furnish her with the mission to help other children? How did she succeed to such an extent on such limited resources?

I personally owe her a great deal as a parent whose son benefited from the work of the Dyslexia Institute, as a teacher who gained a Dyslexia Institute Diploma in the early eighties and then taught with the DI, and as the current Executive Director of a flourishing and professional organisation.

The relaunch of *Dyslexia Review*, exactly 25 years on from the first issue, demonstrates how far we have progressed in some ways but reminds us of how much more remains to be done. I hope that the inspiration that came from Wendy Fisher will live on in *Dyslexia Review* through the 1990s.*

Liz Brooks is Executive Director of The Dyslexia Institute.

25 YEARS AGO

From Dyslexia Review, Number One, April 1969

In the past few years there has been a swing among leading educational psychologists to the view that dyslexia is a problem in its own right. The comfortable old notion that a child who fails to read must be Dull, Deprived or Disturbed, is being eroded by the Word Blind Centre with their research on dyslexia, and by the reading research departments of Universities. The Government sponsor, quite rightly, an expensive Road Research Laboratory and a Common Cold Research Unit; it is high time they added research into reading methods and started a national inquiry into special educational needs. The 10% of our children who leave school each year barely able to write their names or read the simplest signs is reason enough. Amongst the vast numbers of failures it is scarcely surprising that failure due primarily to a specific reading disability (for example, specific developmental dyslexia, minimal neurological dysfunction, etc. etc.) is not being identified separately and diagnosed appropriately for specialised remedial techniques.



This page is in future to be filled, we hope, by readers' letters You are invited to write to the Editor on any professional matter; or to use this as a forum to seek views or information from colleagues. Other professions find this a valuable and effective means of communication.

Letters, preferably typed, should be addressed to:

The Editor Dyslexia Review The Dyslexia Institute 133 Gresham Road Staines, Middlesex TW18 2AJ.

Letters received too late for publication will be held over until the next issue. The editor reserves the right to shorten letters for publication

PEOPLE

DR. HARRY CHASTY retired as a director of The Dyslexia Institute at the end of last year. He continues as professional consultant, and in private practice.

DR. SUSAN GATHERCOLE, formerly of Lancaster University, has become Reader in Psychology, Bristol University.

PROFESSOR MARGARET SNOWLING has been appointed to a chair of psychology at York University. Professor Snowling is external examiner for the Dyslexia Institute/Kingston University Post-Graduate Diploma.

MARTIN TURNER, Head of Psychology, The Dyslexia Institute, has been appointed to the National Curriculum English Committee.

EILEEN MCCORMACK, Dyslexia Institute, Regional Principal (South), is now based at The Dyslexia Institute London Centre. (Telephone - direct line - 071 730 0272/Fax 071 730 0273. Mrs McCormack has become a member of the National Council for Voluntary Organisations Adult Working Group.

FORTHCOMING EVENTS

SPECIAL NEEDS EXHIBITION (Essex Learning Support) 4th May 9.30 - 6 pm Marconi Sports & Social Club, Beehive Lane, Chelmsford, Essex

DYSLEXIA : CONFIDENCE IN THE CLASSROOM |2th May University of Sussex (Falmer Site)

SPECIAL NEEDS (North) Exhibition 16/17/18th May Haydock Park, Liverpool

STUDY SKILLS COURSES & SPELLING COURSE (end of July) Details from London Dyslexia Institute (071 730 8890)

TESTING FOR SPECIFIC LEARNING DIFFICULTLY and CODE OF PRACTICE

Summer '94 Details from the Dyslexia Institute, Tonbridge (0732 352762)

TESTING FOR SPECIFIC LEARNING DIFFICULTY and CODE OF PRACTICE

Autumn '94 Six week course (| hour x 6) Eastbourne Teachers Centre, East Sussex. Enquiries to Anne Waite

DYSLEXIA INSTITUTE AWARENESS WEEK

3rd - 9th October (Details in Autumn issue)

ISIS Exhibition at Olympia 2 15th - 16th October

LONDON SPECIAL NEEDS EXHIBITION

18th - 19th October The Business Design Centre, Upper Street, Islington, London N1.

DYSLEXIA INSTITUTE GUILD SYMPOSIUM 3rd December Kingston University

(Details in Autumn issue)

e How do you spell DysLEXIAI eima inte

Individuals or Associations who wish to have information included in this section should send details to The Editor in good time (See 'Notes for Contributors'). No charge will be made.

ACCORDING TO ...

One joy of being a granny is seeing each new arrival explore the fun, the wonders; discover the songs and stories. Morag's books were often upside-down, her songs garbled. But she was bright and happy, with her pets and dolls, and eager to go to school like her brother.

Disaster followed. The household dreaded each homecoming, the school bag hurled across the floor, the tantrums, the hysterics, and later the nightmares. I was shocked to find when she was visiting me, her rag doll in the shed tied up hand and foot, its smile gagged with sticking plaster. Usually I enjoyed her company in the country. Times and directions could elude her, and twice in town it took the help of the police to find and return her. But with freedom and animals she felt at home, especially with Tom, the old pony.

Her animals always thrived, and she bred hamsters successfully. Once a sympathetic teacher rang home to say, "She had a mouse up her sleeve today, but we made it part of the lesson!" Mother thanked her; then thought, "Why call a hamster a mouse?" Mice were forbidden! But upstairs, she found the hamsters safely in the cage, yet another box with air-holes was hidden under the bed.

Once Morag could read, she was a different child, and so lost her status as school baddie! But she never lost her unforeseeable inspirations. One was to enter old Tom in a competitive local show. He travelled in a cattle loader, and once there forgot the shampooing and fuss in an orgy of the extra rich grass. Eventually he waddled in to the ring among smart extended trotters and figure of eight canters and, while judges huddled against the downpour and relatives hid, Tom and Morag went slowly round and round in their own happy dream-time.

By inspiration Bonnie Prince Charlie - who could speak four languages and spell in none - raised an army from the heather; and lost the lot through failure in planning. (But no planner could have done it in the first place). By inspiration Scotland in 1560 legislated for universal education, planning "a school in every parish". Illiteracy was shameful.

The shame today is Scotland's failure to give these word-blind children specially trained help "according to their needs"

Dumfries and Galloway excepted, we now lag behind England to all our loss. Anyone can recognise the class dummy, disrupter, potential truant - young offender? Who sees the despair? The rag doll is still a powerful pleader. Who withholds the key?

THE DYSLEXIA INSTITUTE GUILD

The Guild is a professional body established in 1994 to:

- specialise in the development of individuals involved in the field of dyslexia;
- increase networking opportunities through publications and an annual symposium;
- broaden the sphere of influence and develop and maintain appropriate links with other bodies and organisations at all levels;

At the moment there are three levels of membership:

Graduate

attainment of Post-graduate level of qualification - through Dyslexia Institute training programme initiated in 1993;

Affiliate

other D.I trained teachers and teachers currently in D.I training, psychologists, doctors, parent governors or any other interested individuals.

Friend

open access. Any individual wishing to keep in contact with the work of The Dyslexia Institute - parents, media, supporters.

Graduate and Affiliate members receive Dyslexia Review, a. professional journal, published termly, providing the latest details on research findings, methodology and current developments. Graduate and Affiliate members will also receive a Membership Directory, containing the names and addresses of members; copies of As We See It, published twice yearly; other benefits, such as reductions on D.I. training days and discounted subscriptions to specialist publications.

The response so far has been both positive and encouraging with several hundred members already committed. Clearly there is a fellowship of interest and dedication amongst those working in the field and it is hoped that the Guild will act as a catalyst for that fellowship.

Anyone interested in joining the Guild should contact the Guild Secretary at The Dyslexia Institute, 133 Gresham Road, Staines TW18 2AJ. Telephone (0784) 463851. *

Madeleine Mohammed is Guild Secretary and Course Director of a postgraduate Diploma Course.

BOOK REVIEWS

Working Memory and Language

SUSAN E. GATHERCOLE AND ALAN D. BADDELEY Essays in Cognitive Psychology series, Lawrence Erlbaum Associates

266 pages. Hardback ISBN 0-86377-265-x Paperback ISBN 0-66377-289-7

This book, written by two cognitive psychologists specialising in the field of working memory, is aimed at a multidisciplinary readership. The authors seek to explore the relationship between working memory and various aspects of spoken and written language by surveying a wide range of recent research. Language areas covered include vocabulary acquisition, speech production, reading development, phonological processing, visual word recognition and language comprehension.

The first chapters, which form an introduction to working memory, owe much to Alan Baddeley's earlier work and terms such as the central executive, the phonological loop and the visuospatial sketch pad will already be familiar to many readers.

For a speech and language therapist the chapter on speech production was of particular interest, but teachers would be well advised not to turn straight to the second half of the book, which deals with written language. For example, the chapter on vocabulary acquisition, and the effect of phonological memory competence on new-word learning, is of direct relevance to the SpLD child or adult who manifests wordfinding difficulty or has problems in mastering a foreign language.

The particular value of this book is in its bringing together a wide range of research areas, covering many disciplines, together with the authors' judgment, or considered withholding of judgment in some cases, on the relationship between working memory and each aspect of language.

The structured format, the overview at the end of each chapter and the sensible interpretation and evaluation of theories and research findings make this an accessible and useful book. It is not a practical teaching manual; however, the thinking teacher will find much that will influence her in her work.

In The Minds Eye:

Visual Thinkers, Gifted People With Learning Disabilities, Computer Images, and Ironies of Creativity

THOMAS G. WEST Prometheus Books, 700 East Amherst Street, Buffalo, New York 14215. 1991. 359 pages. Illustrated. \$24.95

Thomas West's book liberates dyslexics from decades of misunderstanding. Until now, dyslexia has been regarded as a difficulty; but West argues that it should instead be valued as a different and creative way of thinking. The message is clear: the dyslexic's day has come.

The difficulties they face have arisen largely as a result of the emphasis on written language and on the retention and retrieval of raw facts in our education system. However, West describes these as "the skills of a medieval clerk". As the 20th century itself recedes into the middle ages, machines will increasingly perform these tasks for dyslexics - and, indeed, do them more effectively for non-dyslexics too.

West describes the neurological research into hemispheric specialization, from which not only the weaknesses but also the strengths of dyslexics may be understood. He then includes profiles of great thinkers whose difficulties with language have been documented but who have nevertheless possessed an outstanding ability to visualise and to think creatively. Einstein and Edison are discussed, but also other scientists and mathematicians such as Faraday and Maxwell. West argues that it is precisely because they viewed the world differently that they were able to make breakthroughs in their fields.

Scientists and mathematicians, West suggests, are increasingly frustrated by "the compartmentalisation of science". It is the visual thinker, so frequently dyslexic, who is able to work from wholes to parts and to perceive patterns in data that are more and more often presented visually on computer screens. West backs this up by discussing chaos theory, fractals and recent developments in computer science. Ironically, readers are left thinking that an effort will have to be made to value the nondyslexic who may have difficulties in our new world of computer images and creative thinkers!

West challenges us all to consider whether we are "focusing on the wrong kind of skills" in our schools, In the Mind's Eye, therefore, makes compulsive reading; its message is not only for teachers and psychologists, but for all those shaping our political and economic future.

Felicity Patterson is Training Principal for The Dyslexia Institute in South-East England and Coordinator of the 16+ teaching development.

Janet Townend

BOOK REVIEWS

Mathematics for Dyslexics A Teaching Handbook

Chinn & Ashcroft. Published 1993 by Whurr. ISBN: 1-870332-74-1

Having met both Steve Chinn and Richard Ashcroft at Mark College and discussed their teaching programme with Richard, I am pleased to have the opportunity to review the above book.

Less has been written on dyslexia and mathematics than on dyslexia and literacy. It was originally assumed that dyslexia was a problem with reading and spelling. Over the years that definition has been expanded to include other areas and people now appreciate that it can affect numeracy and/or mathematics. (L. Joffe suggests that perhaps 60%+ of dyslexics have problems in some areas of mathematics).

With this appreciation comes a desire by many to understand and help those students with mathematical difficulties.

What interested teachers need are more practical guides to assessment and teaching. This is where this book has its niche.

Although Mark College takes students from 11 to 16, much of the content of the book is relevant to both younger and older students.

At Mark College it is possible for pupils to follow the teaching programme 'full-time', but for those teachers working on a one/two hour a week remedial basis it is still relevant.

Whilst the book discusses the difficulties often encountered by dyslexic students, together with a very clear explanation, and

examples, of the two learning styles of mathematics, the bulk of the book, as I have already said, is devoted to practical ways of teaching the subject.

Assessment and understanding of the difficulties must come before tuition. The testing procedure suggested is very comprehensive. My only, minor, concern is that I should like even more emphasis on the information gained by asking the students, 'How did you do that?' I realise that many dyslexics have difficulty in verbalising thoughts and procedures; however it is important to find out how they are thinking, and the level of knowledge. Do they really understand what is to be done, or are they relying on remembering, often incorrectly, a taught procedure?

The chapters on teaching are clearly explained, illustrated and easy to follow. They explain how arithmetic/mathematics is taught, using concrete materials where possible and do not use more theoretical language than is necessary. This means that the book is suitable for teachers with an essentially literacy background who may lack confidence, but would, nevertheless, like to help students with mathematics.

Appendix 1 is a comprehensive list of books, journals, tests and games for further information. Appendix 2 is a list of teaching materials with suppliers' addresses. The inclusion of these provides a starting point for further research by those interested teachers. Overall I think that this is a valuable book, one of the few of its kind available in this country at present. I think it is essential reading for any teacher of mathematics to dyslexics. It should give support to the unsure, and provide a useful resource for all. At just under £20 it may seem expensive, but will be money well spent. *

Pauline Clayton is currently on secondment from The Dyslexia Institute to Kent University where she is project leader for HEFCE funded research on Access courses and dyslexic students. She is Maths Coordinator for The Dyslexia Institute.

Notes for contributors

- 1. Article headings should appear as follows:
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