On dyslexia and Indian scripts

Dyslexia is a reading disorder found in about two per cent of school children in the West. A child finds it hard to make a connection between a letter and the sound it represents in a word; it may recognize 'T' on a page but may have trouble grasping that in the word 'toe', 'T' makes the 'tuh' sound. Words or letters may get 'reversed' – 'was' read as 'saw' or 'barn' read as 'darn'. The disorder was attributed earlier to 'visual miswiring', the view now veering round to a problem in the way the brain processes the sounds of language. The condition is not an aspect of mental retardation (or 'laziness') since it appears not to be related to intelligence as ordinarily understood; many dyslexics have become famous achievers (an example being Albert Einstein!).

As reported by J. Blake of the *Seattle Times*, V. Berninger *et al.* at the University of Washington (UW), Seattle, USA, have found that intense and highly detailed instruction in phonics boosts the reading abilities of dyslexic children. Indexed by lactate levels in certain regions, imagings of the brain have shown that dyslexic children expend more energy to accomplish the same tasks as normal ones, but there was a significant lessening of this difference as the training in phonics proceeded.

That report brought to the fore certain aspects of scripts and phonic representations to which even researchers in the fields of dyslexia and allied disorders appear not to have paid much attention. The letter-symbols of the Roman (or Cyrillic) script used in the Western world, being inadequate to stand exactly for what is sought to be vocalized, fail to render in a properly phonetic manner what is spoken (even with the conventions associated with diacritical marks). Besides having the letters 'arranged' in a unscientific way, the scripts are beset with a difficulty – the letters are given what I would call 'proper names'. For example, 'b' in 'bat' is 'named' *bee*, 'c' in cat *cee*, both the 'l's' in 'loyal' as *el*, etc., adding to the difficulties of dyslexics – the 'values' of the letters differ when they stand alone and when they get used in a word.

All of the scripts of the major languages of India share two important features. Firstly, the vowels are listed separately from the consonants and both lists are organized according to a hierarchy in the anatomy of vocalization. (Such classification evolved by the ancient Indians more than two and a half millennia ago is unique to the languages of India, even predating, perhaps, the formulation of Panini's *Maaheshwara Sootras*). Secondly, the Indian method of writing amounts to the setting down of one symbol per syllable. Exact and unique phonetic representation becomes easily possible.

Now to my real question: If the results of Berninger *et al.* are not episodic or anecdotal, can we expect a lesser incidence of dyslexia among young Indians literate in their own languages, given that they get to be 'phonetically trained' from the very beginning? It may be highly simplistic to expect anything like that, given the complexity, range, variety and depth of human behaviour. Still it is necessary to collect the relevant statistics, if none have been collected so far. If comparisons are to be drawn between Western (American) and Indian figures, 'extraneous' factors like differences in home atmosphere, specific cultural differences, economic/nutritional status, etc. have to be filtered out from the 'samplings'. How are we to do that? I think there is a fertile field for research here. I urge qualified readers to take an interest in the matter.

There is an International Dyslexia Association that may fund the research. Its website is: www.interdys.org.

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Shall we learn a few lessons from the father of American science on the wisdom of patenting knowledge?

We should think seriously[1] on the wisdom of following the West's (primarily that of USA) course as a fashion, and not fool ourselves into believing that we are nearly their equals.

We are not even sure that the current American obsession for a patent culture permeating all spheres of S&T activity, which obviously is meant to guard their global commercial interest, was not seeded in internal competition to harness technological innovations by the business entrepreneurs on home ground. Bernard Jaffe in the introduction of his book[2], states the then current internal criticism that '. . . while in applied science the United States has kept pace with and even forged ahead of our European contemporaries, we have lagged behind in the realm of pure science – the search for truth with no thought of practical application or pecuniary reward'. He, nevertheless, explains the phenomenon convincingly[2]:

'The reasons for this tremendous output of practical applications of science [about eight million patents by 1935 and leading the world – twice as many as that of Great Britain and France and four times that of Germany] lie in the nature of the social forces *which have been at work in the building of United States.* From the beginning, our people were engaged in subduing a land of great area, a land rich in natural resources and, in the early years, low in manpower. We

were a new country. . . . The mind, the labour, and the energies of the forebears were occupied for two hundred years with immediate problems of conquering a country and holding dominion over it. The inventive genius of our people was challenged to produce new and swifter means of transportation and communication as well as labour-saving devices to accomplish this prodigious task. The inventive capacities and technological skills of America were stimulated to a fever heat' (emphasis added).

Subsequently, however, for reasons mentioned below, the Americans succeeded in establishing a lead in basic research without aiming at commercial gains. Our concern, though for a much less ambitious target, is qualitatively the same today – to ensure international levels in our S&T activity, lest we succumb hopelessly to market forces generated elsewhere without building our own capability to drive it. Let us note Jaffe further down in the same introduction[3]:

'Since the days of these pioneers of American science, more particularly within the last fifty years, there have been two significant changes. These are an acceleration in the tempo of scientific discoveries and a noticeable greater emphasis on theoretical science. One of the reasons for these changes is the final disappearance of the territorial frontier. Restless, adventurous, imaginative men have been *compelled to find new outlets for their energies in the new and never-closed frontiers of knowledge. Men with keen mathematical minds, for example, are no longer snatched up in large numbers by the pioneering business enterprises for their numerous surveys. Instead, they are exercising their mathematical and theoretical powers in research laboratories*' (emphasis added).

We, unfortunately, are still waiting for such adventurous minds amongst us while coolly watching their drift into MBA culture to start careers by counting currency notes or marketing foreign goods and technologies, many of which are covered by patents of other nationals.

However, it is strange that the great nation, the United States, which until recent past succeeded in subduing the urge to commercialize knowledge, seems to have lost sight of the high ideals[4] that guided her policies and efforts in scientific activities to become the world leader in basic science without conceding the position of supremacy in technology. It may be worthwhile for the world scientific community to note that when Benjamin Franklin – often claimed to be the father of American science – was offered a patent by the Governor of Pennsylvania on his innovative stove designed for safe heating of rooms during the cold weather, he refused to oblige, giving the following reason[5]: 'That we enjoy great advantages from the inventions of the others, we should be glad of an opportunity to serve others by any invention of ours'.

And again when confronted by King George III of England (America was still a colony of the British Empire) who had the pointed lightning rods (discovered by Franklin and which became immediately popular because of its effectiveness) removed from the Palace and replaced with the round, knobbed type because of a controversy raised by some scientists close to the King, Franklin quietly withdrew from it, and wrote[6]:

'I leave them to take their chance in the world. If they are right, truth and experience will support them; if wrong, they ought to be refuted and rejected. Disputes are apt to sour one's temper and disturb one's quiet. *I have no private interest in the reception of my inventions by the world, having never made, nor proposed to make, the least profit by any of them*' (emphasis added).

If ever in future we do succeed in generating[1] '. . . more useful "intellectual property" so that the task of protecting it becomes worthwhile', perhaps, we should seek guidance from the spirit of sages like Benjamin Franklin, not that of his modern descendents. But will our recalcitrant stubborn culture with its unnerving indifference towards the quality of R&D and higher education permit the luxury of such dreams, and not reduce us to a race of timid people ready to sell their talents to others for pecuniary benefits?

1. Balaram, P., *Curr. Sci.*, 2000, **78**, 1277–1278.
2. Jaffe, B., *Men of Science in America: The Role of Science in the Growth of our Country*, Simon and Schuster, New York, 1944, p. xxviii.
3. *ibid*, p. xxxiv.
4. John Naughton notes a few brilliant recent exceptions in the history of internet in his book *A Brief History of the Future: The Origins of the Internet*, Universities Press (India) Ltd, Hyderabad, 2000, p. 230.
5. Ref. 2, p. 26.
6. *ibid*, p. 32.

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Gem cutting – No child's play

I am writing this in relation to the book review by K. Govinda Rajan (*Curr. Sci.* 2000, **79**, 381–382) on *Gems and Gem Industry in India* by R. V. Karanth, published by the Geological Society of India, Bangalore. I am grateful to the reviewer for his appreciation and suggestions to improve the content of the book. I would, however, like to clarify one of the remarks made by the reviewer, (p. 381) – 'photos 8.13 and 8.17 seem to clearly show child labour being employed!'.

The children in the photographs (figures 8.13 and 8.17) happen to be there just to get photographed. Indeed, the fascination for being photographed is a human tendency. As one can visualize the children are just posing in these two