100 YEARS AGO

Only a few decades ago the real nature of tuberculosis was unknown to us: it was regarded as a consequence, as the expression, so to speak, of social misery, and, as this supposed cause could not be got rid of by simple means, people relied on the probable gradual improvement of social conditions, and did nothing. All this is altered now. We know that social misery does indeed go far to foster tuberculosis, but the real cause of the disease is a parasite — that is, a visible and palpable enemy, which we can pursue and annihilate… Such a conflict requires the cooperation of many, if possible of all, medical men, shoulder to shoulder with the State and the whole population; but now the moment when such cooperation is possible seems to have come… If we are continually guided in this enterprise by the spirit of genuine preventive medical science, if we utilise the experience gained in conflict with other pestilences, and aim, with clear recognition of the purpose and resolute avoidance of wrong roads, at striking the evil at its root, then the battle against tuberculosis, which has been so energetically begun, cannot fail to have a victorious issue. **Robert Koch**

From *Nature* 25 July 1901.

50 YEARS AGO

The year 1950 was a good one for studying the movements of swifts (*Apus apus*), and during the year the movements of forty thousand birds were recorded: a report on the observations has been made by H. G. Hurrell and recently described in *British Birds* (44, No. 5; May 1951)… Swifts appear to penetrate the country from the south and work northwards. Arrivals over many years average a day or two earlier in the south than in the south-east. The east coast as a rule is reached rather late and usually in such small numbers that there is little to indicate any spring passage of swifts from the British Isles to other countries. It is difficult to say when the arrival period ends because movements which have a migratory appearance may take place at any time while swifts are in Britain. Large movements occur in June and early July. These are thought to be undertaken because unfavourable weather forces the swift to seek regions with more adequate food supplies; the food of the swift is adversely affected by the passage of a cyclone or depression.

From *Nature* 28 July 1951.

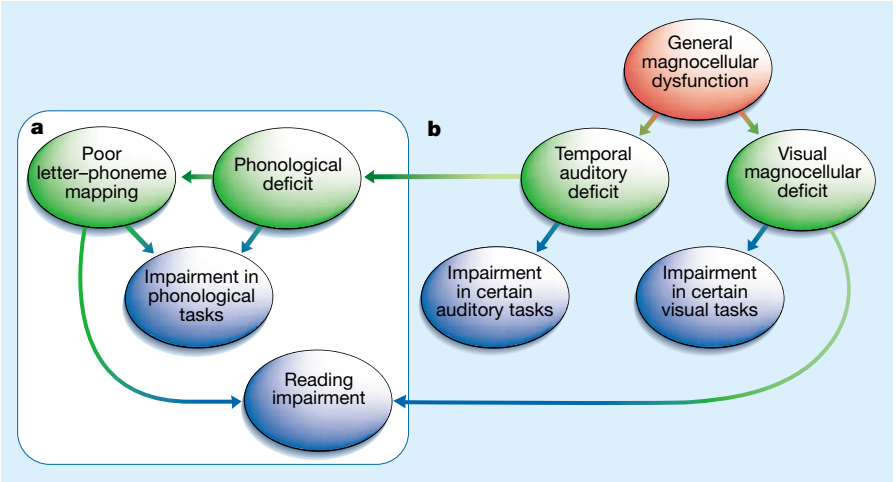

Figure 1 **The phonological and magnocellular explanations for dyslexia. Ovals represent impairments at the neurological (red), cognitive (green) or behavioural (blue) levels; arrows represent causal connections.** a, **The phonological theory holds that the core cognitive deficit lies in the ability to represent or recall speech sounds (phonological representations). This results in defects in mentally mapping letters to phonemes, and leads to reading impairments and problems with phonological tasks. The neurological basis for the phonological deficit, however, is not yet known.** b, **The magnocellular theory is based on the division of the visual system into two neuronal pathways: the magnocellular and parvocellular pathways. This theory holds that the magnocellular system is abnormal in people with dyslexia, causing difficulties in some aspects of visual perception and in binocular control that may cause a reading impairment. In addition, similar impairments in the auditory system are suggested to cause a deficit in processing the rapid temporal properties of sounds, leading to the phonological deficit.**

Witton, Univ. Oxford), it is becoming apparent that these group effects result from only a minority (typically one-third) of the dyslexic participants. The remaining two-thirds fare normally (S. Rosen, Univ. College London). Other teams have failed to find significant differences between dyslexic and control groups, but usually discover a few people in the dyslexic group who do have sensory defects (Y. Griffiths, M. Snowling, Univ. York; S. Heath, Univ. Western Australia; M. Van Ingelghem, KU Leuven; S. Amitay, Hebrew Univ. Jerusalem). So, although most studies have shown that some dyslexic people have sensory deficits, the prevalence and significance of such deficits remain uncertain.

One consideration is the tasks used to investigate these defects. Given that attention and general cognitive abilities are involved in sensory tasks, it is not surprising that differences in auditory and visual processing can sometimes be explained by differences in non-verbal intelligence (M. Ahissar, K. Banai, Hebrew Univ. Jerusalem). Likewise, verbal skills, such as verbal short-term memory, may influence performance. A typical task requires a person to judge the order of events: two, three or four stimuli are presented one after the other, and the subject must recall the order of the stimuli, or say which one was different from the others.

Clearly, this task requires storing the stimuli in short-term memory, which might involve a verbal strategy; subjects might mentally rehearse the words 'high, low' so as to remember that they heard a high tone followed by a low tone. Yet many people with dyslexia also have problems with verbal short-term memory — a characteristic of the phonological deficit. Indeed, when people are explicitly instructed to use a verbal strategy in this task, control subjects fare better than before, whereas dyslexics perform more poorly (C. Marshall, Univ. York). Similarly, dyslexics have difficulty in discriminating between some visual stimuli when presented sequentially, but not when presented simultaneously (G. Ben Yehuda, Hebrew Univ. Jerusalem). Perhaps, then, the presumed sensory deficits actually reflect strategic differences.

Even when sensory deficits are found, they do not always appear in the ways predicted by the magnocellular theory. For instance, the magnocellular visual pathway is most sensitive to stimuli of low spatial frequencies, presented under low lighting and at low contrast. So one would predict visual defects in dyslexics to be most apparent under these conditions (for example, when having to detect gratings of thick light-grey and dark-grey stripes appearing on a screen in the dark). Yet people with dyslexia typically fare worse than control subjects at all spatial frequencies (that is, whether stripes are thin or thick)[8] (G. Ben Yehuda), as well as at tasks in which frequencies are not entirely controlled and contrast and lighting are high (M. Bradshaw, Univ. Surrey; M. Van Ingelghem). Similarly, the theory predicts that the auditory impairment will be limited