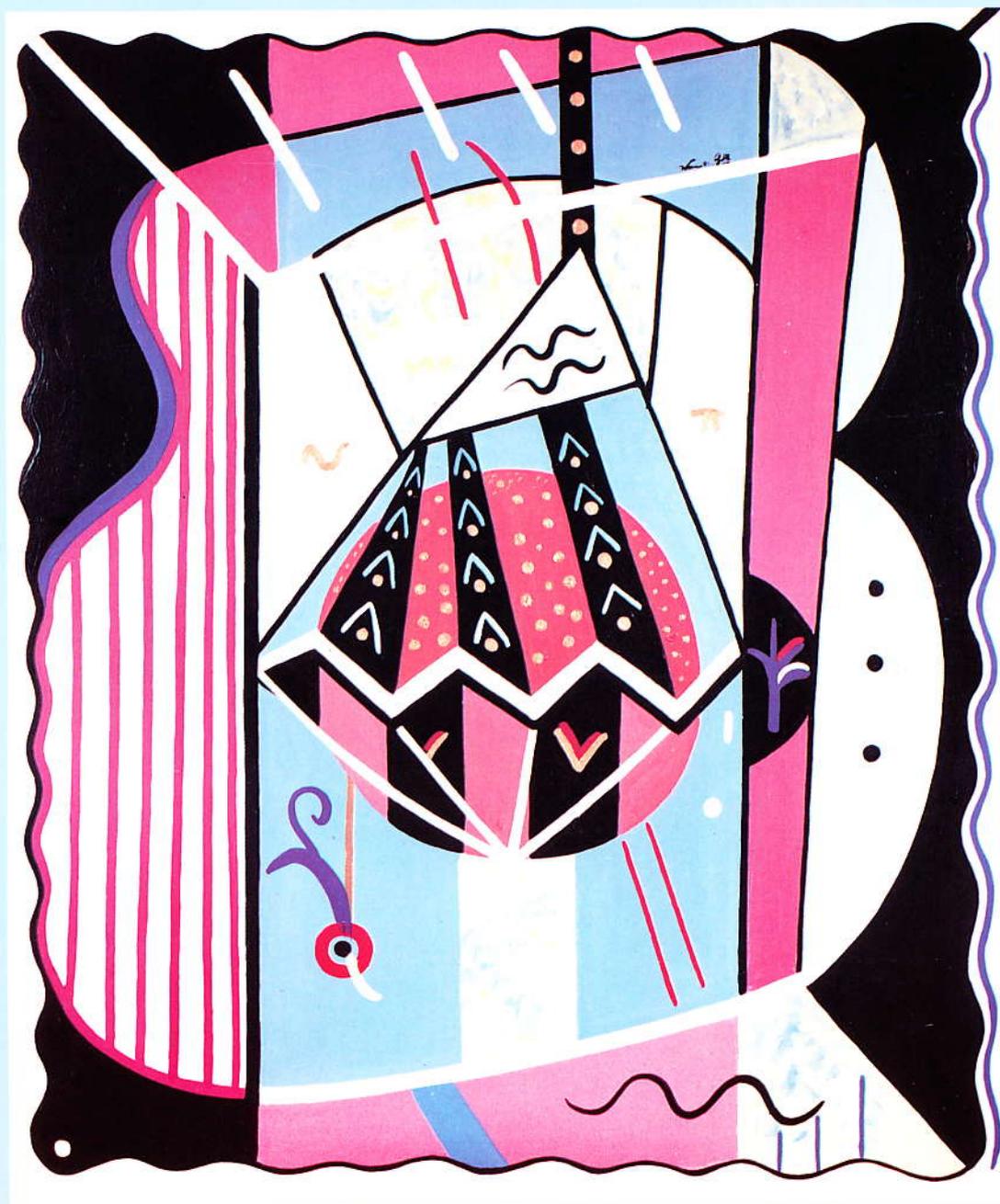


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# SYNAPSIA

THE INTERNATIONAL BRAIN CLUB JOURNAL  
Volume 4 Spring 1993 Number 1

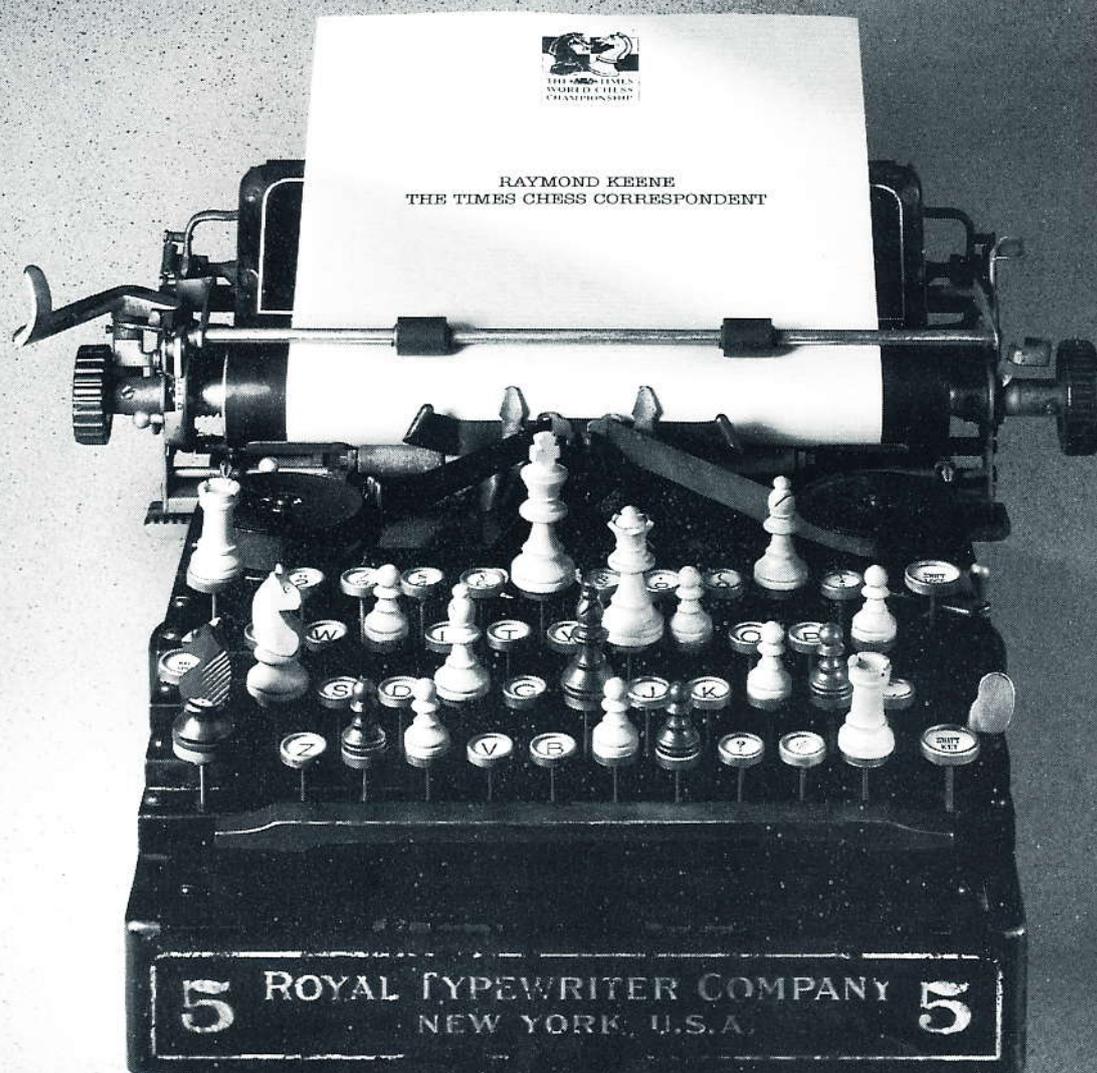


Musical Warp by Lorraine Gill

In this issue

- The Great Divide •
- Memoriad '93: Interview with Dominic O'Brien •
- World Chess comes to London •

# For the best coverage of the Grandmasters, read ours.



Garry Kasparov, the undefeated World Chess Champion and Nigel Short, the brilliant British challenger will soon be fighting it out for The Times World Chess Championship. Following their every move will be Raymond Keene, OBE of The Times (and, as you'll know already, also of the Spectator).

An International Grandmaster himself, his own credentials are almost as impressive as theirs. He's the former British Champion and an Olympic medallist.

What's more, he'll be the only writer with behind-the-scenes access to the forthcoming title battle,

including exclusive interviews with the players. In fact his coverage has already started, his daily column giving rare insights into this historic event.

Tickets for which are on sale now. It takes place at London's Savoy Theatre between September 7th and October 30th. You can reserve yourself a seat by phoning First Call on 071-497 9977.

Of course, if you can't make it, there's only one way to keep up with both the build up and the contest. That is, buy The Times.

In other words, keen followers will be reading Keene.

**THE**  **TIMES**

# SYNAPSIA EDITORIAL

## Processing power

Of all the amazing technological advances to have been achieved in recent times, perhaps the most remarkable are those in the field of computing. Fifty years ago, Alan Turing first postulated the theory behind a computing machine, and since then the beasts have grown in power and shrunk in size at a phenomenal rate. Technology that only quite recently would have filled several rooms of laboratory space and required numerous technicians to service, is now available in a pocket calculator that can be purchased for the price of a meal. In Turing's day the technology that sits inside our more sophisticated machines would have been the stuff of highly improbable science fiction. Computers are becoming ever faster, larger in terms of storage capacity and yet smaller in physical size. The desktop has given way to the lap-top, the lap-top to the notebook and even palm-top computing is favoured by some.

However, we should not forget that the most remarkable computer ever to come into existence is the ultimately portable model that we are fortunate enough to carry around with us wherever we go. Any computer scientist would cheerfully admit that a cockroach navigating its way across a kitchen floor exhibits substantially more carbon-based computing power than the most powerful silicon equivalent yet constructed. Despite having access to trillions of bits of information and having the ability to process these at a rate of many millions per second, the silicon cockroach would be more likely to get trodden on than to arrive safely at its destination. Even if it negotiated this task, finding and consuming food to stay alive would represent an information processing hurdle that would make putting a man on the moon seem simple in comparison.

Anyone wanting confirmation of the brain's extraordinary abilities should consider events reported here and elsewhere by *Synapsia*: Fermat's Last Theorem, a conundrum which has baffled the best mathematical minds for three centuries, has finally yielded to an assault by raw brain power (see *Synaptic Flashes* and next issue

for a full report); in 1992 Dr Marion Tinsley, the 65-year-old draughts world champion, defeated the computer program *Chinook* - an extraordinarily powerful opponent capable of analysing three million draughts positions per second and visualising a minimum of 23 moves ahead in any situation (see *Synapsia* Vol 3 No 3).

Finally, reporting on an encounter in a chess tournament pitting man against machine (see *Synaptic Flashes*), grandmaster Dr John Nunn demonstrated exactly the right attitude to adopt when confronted by silicon armoury: 'Zugzwang was one of the few competitors not physically located in the tournament hall. Instead there was a modem link to the University of Paderborn, where Zugzwang's hardware was located. The programmer told me that this consisted of 1000 processors, operating in parallel at millions of instructions per second. This sounded like an intimidating array of hardware, but then it occurred to me that the human brain consists of several billion processors (brain cells) operating in parallel. Even if only a very small percentage of these are devoted to chess, then they still out-number Zugzwang's array by a considerable margin.' The 'Doc' went on to win the game in 40 moves.

### THE BRAIN CLUB CHARTER

The Brain Club was incorporated on 15 May 1989, and became a registered charity on 23 November 1990. Its official charter states the Club's formal purposes:

- A. To promote research into the study of thought processes, and into the investigation of the mechanics of thinking as manifested in learning, understanding, communication, problem-solving, creativity and decision-making.
- B. To disseminate the results of such research and study.
- C. To promote generally education and training in cognitive processes and techniques.
- D. To develop and exploit new techniques in cognitive processes.

The editor welcomes contributions to *Synapsia*. Please contact him at: 23 Ditchling Rise, Brighton, Sussex BN1 4QL.

**SYNAPSIA Vol 4**  
**No 1 Spring 1993**

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Pécub, the world's fastest brain cartoonist, is happy to provide cartoons based on your ideas and requests.

Design, artwork and typesetting by Byron Jacobs.

Printed by Berforts  
8 London Road  
St Leonards-on-Sea  
East Sussex TN37 6AE

Photos: McShane v Kasparov, *Claire Smith*; Short and family, *Rosa de las Nieves*; Short, *J. Canlapen*; Garry Kasparov, *Mark Huba*  
Front cover photograph by *Norman Weston*

21st February 1995

Make a date!

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What is the cause of our differing emotional responses to music? Does the answer lie in the left brain/right brain divide?

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Dominic O'Brien, the World Memory Champion, defends his title at this year's Memoriad. Read how Richard Branson and Joan Collins help him on his way.

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In this, the first of a series of articles by artist Lorraine Gill, we rediscover our natural perception.

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# SYNAPTIC FLASHES

## Brain News

### Number up for Fermat

One of the most baffling problems in mathematics; one which has mystified mathematicians for more than three centuries, has finally been solved. Professor Andrew Wiles, a British-born mathematician at Princeton University, recently announced the solution in a lecture at the Isaac Newton Institute for Mathematical Sciences in Cambridge. The problem dates from the seventeenth century when French mathematician Pierre de Fermat scribbled in the margin of a printed book the statement that  $x$  to the  $n$ th power plus  $y$  to the  $n$ th power never equals  $z$  to the  $n$ th power if  $n$  is greater than 2. Fermat tantalisingly added that he had worked out a proof of this, but that the margin was too narrow to contain it. As Professor Wiles's solution runs to 1000 pages of notes, it is unlikely that this is what the Frenchman had in mind. A remarkable aspect of the proof is that, despite the exponential increase in computing power over the past two decades, it owes little to silicon technology and almost everything to the human brain. The announcement of the proof caused a tremendous stir in the press and was even the subject of a *Times* leader article. See next *Synapsia* for a full report.

### Stacking the Deck

According to traditional genetic wisdom, genes are subject to the theories of natural selection. The useful ones are passed on from generation to generation, while the unhelpful ones get weeded out by virtue of their unfortunate carriers dying before having a chance to mate and pass them on to their offspring. However, recent work by Sergei Agalnik at the Russian Academy of Sciences indicates that some genes may have a form of intelligence which generates an awareness of whether they are likely to survive in the long term. Dr Agalnik's experiments with mice have revealed that some 'positive' genes are gaining more than their expected 50% representation in their offspring. Similarly, some 'negative' genes, seemingly aware of the fact that they are wasting their time and are doomed to extinction anyway, are not bothering to

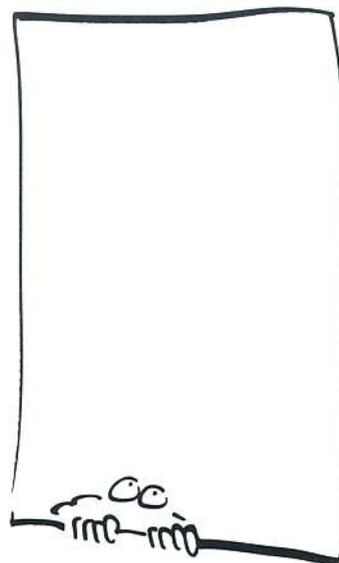
enter the lottery. The mechanics by which this can happen are not clear, but it seems that Dr Agalnik and his team may be on to something.

### Word Perfect

Alan Saldanha, a 15-year-old from Chelsea, has become the youngest-ever winner in the 23-year history of the National Scrabble Championships. This is a remarkable achievement in a field where one would expect experience to be of paramount importance. Alan's mother, Marjory Saldanha, said that they had discovered that Alan possessed an astonishing 'sight vocabulary' when he was just two, and would indicate words on advertising hoardings that he had seen in magazines. Alan will be continuing his scrabble career as part of the British team competing in the world championships in New York in August. *Synapsia* will keep you posted.

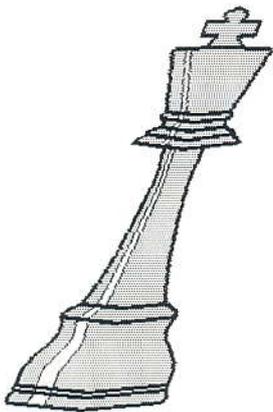
### Parallel Processing

Chess-playing computers taking on grandmasters is no longer news these days, but an interesting annual event has just been completed in Holland. This is the Aegon Man-Computer tournament and consists of 32 computers competing with 32 humans in a six-round event. The organisers are careful to invite a similar strength human field each year in order that the results can give an indication of the development of computer technology in the intervening 12 months. This year was a success for the metal minds who emerged winners by 98-93, thus gaining revenge for their defeat last year. However, now that very strong computers are no longer such a novelty, signs are emerging that the stronger players have cottoned on to techniques for combatting them. David Bronstein, for example, although no longer such a potent force in the 'human' chess world, has given much thought to how to play against the machines, and followed on from his clean sweep of 6/6 last year, scoring five and a half this time, finishing well above other, stronger, human participants. We await next year's results with interest.



# WORLD CHESS COMES TO LONDON

**Later this year, Nigel Short will become the first English player of modern times to compete for the World Chess Championship when he meets Garry Kasparov in London. GM Raymond Keene OBE offers a personal diary of Nigel's historic qualification as well as a summary of the dramatic events leading to the finalists' breakaway from FIDE and the formation of the Professional Chess Association.**



## January 16

The past year has been an *annus mirabilis* for chess. At the start of 1992 an astounding 15-year-old girl, Judith Polgar, became the youngest-ever grandmaster. Soon after, Nigel Short defeated living chess legend, Anatoly Karpov, to penetrate farther into the world championship cycle than any Briton has ever done before. Finally, it was a year in which Bobby Fischer emerged from two decades of self-imposed hibernation to make a dramatic comeback and seize world headlines by playing a match in the centre of war-torn Yugoslavia.

As the culmination of all this, on January 10, in El Escorial, outside Madrid, Nigel Short commenced play against Dutch grandmaster Jan Timman in the final eliminator to decide who challenges champion Garry Kasparov for his crown later this year. For British chess fans, this is the most important chess event since competitions were officially launched at London in 1851.

For the past three years, Nigel has been homing in inexorably

on this goal. As a first step, Nigel had to fight his way through the massed ranks of grandmasters at the Manila Interzonal of 1990. Then came the head-to-head elimination matches, starting, ironically, against Nigel's friend and colleague on the English team, Jon Speelman. Speelman fell, but only after giving Nigel some severe frights. Next, in Brussels in August 1991, Nigel was pitted against Russian Boris Gelfand, tipped by Kasparov himself as a future challenger. After a shaky start, Short won through again, only to be rewarded with a semi-final against the redoubtable former champion Anatoly Karpov. This was set for April 1992, in the Spanish town of Linares.

After another poor showing in the early games, Nigel vindicated the confidence of his supporters, taking the contest by a two-point margin. Having vanquished Karpov, Timman seems less formidable, but the Dutchman is a deadly, experienced opponent.

Nigel has been criticised in the past for an owlish, academic approach to the fierce realities of chessboard combat. He was widely said to lack that ultimate killer instinct which makes or breaks the true champions of the game. If so, he has gone to great lengths to eradicate this weakness, and must now be considered one of the toughest competitors psychologically on the international circuit. Short has already, perhaps even prematurely, announced a Muhammad Ali-type verbal war against Kasparov, declaring him to be 'thoroughly



unpleasant and widely disliked'. Meanwhile, Kasparov has retorted to the question as to who will be his opponent in the championship with the withering quip: 'my opponent will be Short and the match will be short!' That put-down cannot have done much for Timman's morale.

### February 6

For two and a half weeks, the two warriors of the mind, Short and Timman, the English and Dutch grandmasters, have been locked in unremitting cerebral combat in the tiny Spanish mountain town of San Lorenzo de El Escorial, 45 minutes from Madrid. The quality of the games has been varied, reflecting, undoubtedly, the enormous stress of the occasion. Although there was much criticism of the level of play in the first half of the match, the second amply redeemed itself, with some of the most exciting, ingenious and nerve-racking play seen at this rarefied level.

Game one was an up and down struggle - both players missed wins and it justly ended in a draw. For game two Short dismayed his supporters, drifting in the opening, then blundering away a piece. Still, mental resilience is one of the hallmarks of any great chess champion, and Short has almost made it his trademark to bounce back immediately from such cataclysmic defeats. Game three was all Nigel's, Timman being swept away by a series of devastating sacrifices, while in game four Timman over-pressed and lost from a good position. From being one down, Nigel now led by a point. However, in game five he conceded a draw, from what had been an almost winning position, while for game six, with the normally advantageous white pieces, Short was struggling from the very start. Evidently he had suddenly found himself trapped in some kind of mental quagmire.

The festering boil burst in game seven, possibly the worst of Nigel's career. Planless opening play led to the loss of a pawn. Amazingly he dragged on his hopeless resistance while Timman's supporters merely chuckled at his plight. This was the nadir of Nigel's fortunes. Scores were even again and remained so for game eight, in which Nigel sought the haven of a swift draw to rebuild his shattered confidence.

Now came the sudden crisis of the match. Game nine was a bloodthirsty, merciless battle. Not one commentator dared predict the outcome. The moves seemed

crazy, illogical. Only hours after Timman had slumped in his chair and acknowledged defeat in the hardest game of the match could grandmasters even remotely piece together what should have happened. Timman, mauled and shattered after this psychological assault, succumbed quickly in game ten. He fought back in game eleven to win a long endgame, but game twelve, another bloodthirsty battle, finally demonstrated Short's dominance.

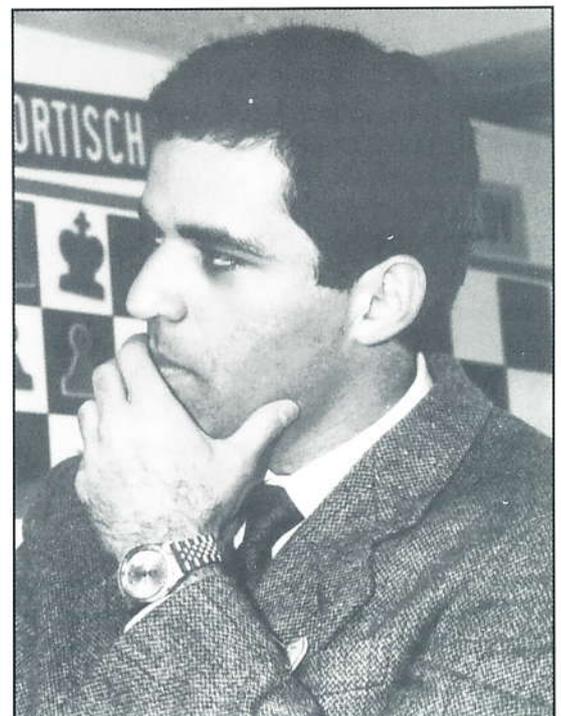
### February 13

At first glance the rating discrepancy between Garry Kasparov (2805) and Nigel Short (2655) appears to be so great as to make their forthcoming world championship contest a foregone conclusion. However, statistics freaks should take heart from a suggestion made to me by Dominic Lawson: namely that Nigel only puts forth his full and genuine strength in his world cycle matches and that all his other competitions he regards virtually as training outings. Accordingly, I have calculated Nigel's rating performance averaged out exclusively over his four qualifying matches against Speelman, Gelfand, Karpov and Timman. The final ELO rating figure for Nigel of 2718 is considerably more encouraging and points to a far closer match than conventional rating figures would suggest.

On Monday, February 8 at 12.00 noon FIDE, the World Chess Federation, opened the sealed bids from competing cities for the Short - Kasparov match. There were only two bids. The first, for one million Swiss Francs, was from Santiago de Compostella in Spain, whose city fathers appear to be caught in a 1970s time warp where world title prize funds are concerned. The other was a joint approach from Belgrade and Sofia of a world record \$5.6 million. The problem here is that the host is the notorious and shady Jezdimir Vasiljevic, whose Jugoskandic Bank funded the

### SHORT - TIMMAN MATCH DETAILS

Short's Result	Overall Score
1 Draw	1/2-1/2
2 Loss	1/2-1 1/2
3 Win	1 1/2-1 1/2
4 Win	2 1/2-1 1/2
5 Draw	3-2
6 Draw	3 1/2-2 1/2
7 Loss	3 1/2-3 1/2
8 Draw	4-4
9 Win	5-4
10 Win	6-4
11 Loss	6-5
12 Win	7-5
13 Draw	7 1/2-5 1/2



Fischer - Spassky match in Belgrade last year. The required bank guarantee for FIDE is, of course, made on Vasiljevic's own bank. FIDE cannot possibly countenance a match in Belgrade while the legality of using Serbian funds to play in Sofia must also be open to doubt.

Recognising the futility of trying to accept either the minute Spanish bid or the internationally unacceptable Yugoslav one, FIDE reopened the bidding, with a fresh deadline of Monday, February 22.

### February 23

On February 17 Kasparov visited London to play 25 consulting teams of four to raise about £30,000 for the Sick Children's Trust charity. The venue, Simpson's-in-the-Strand, the ancient home of chess where the Anderssen-Kieseritzky 'immortal game' was played in 1851, was swamped by the press.

On February 23 FIDE, the World Chess Federation, announced the venue for the 1993 World Chess Championship. FIDE claimed that, in accordance with its regulations, it had consulted both the world champion and the challenger about the decision and taken their views into account. This is untrue. Indeed, Nigel Short was not even informed of what bids had been made before the FIDE President took his decision. Subsequently, again without notifying either player or soliciting their opinion, FIDE has taken the step of announcing the starting date for the match.

This is by no means the first occasion on which FIDE has shown such wilful disregard for the players of the World Championship event. In February 1985, the FIDE President Florencio Campomanes, infamously halted the Karpov - Kasparov World Chess Championship match in Moscow. This was an action condemned as profoundly unethical, not just by the fraternity of chessplayers, but by the world at large. Also later FIDE - under Campomanes - has shown disregard for its own rules, changing them for their own benefit whenever necessary. FIDE has been motivated by factors other than the interests of the sport. It is clear that FIDE cannot be trusted to organise the most important professional chess competition in the world.

Accordingly both Gary Kasparov and Nigel Short have agreed to play their match outside the jurisdiction of FIDE. The match will be played under the auspices of a new body, The Professional Chess Association. Both players have agreed to donate 10% of the prize fund from this match to establishing this body which is intended to represent chess professionals world-wide and work for the good of the game and its educational benefits.

The Professional Chess Association, Gary Kasparov and Nigel Short now invite new bids to stage the Professional World Chess Championship this year, to determine who is the world's strongest chessplayer. Fresh offers are welcome as of course are tenders from those who submitted offers to stage the FIDE World Championship. Offers should be submitted to Solicitors Jacques and Lewis (2 South Square, Grays Inn, London WC1R 5HR) to reach them at latest at close of business on Friday, March 19. Sealed bids will be opened and announced at 11.30am on Monday, March 22 at a press conference at Simpson's-in-the-Strand, the traditional London home of chess. Both press and public are invited to attend. The bids will be opened in the presence of Gary Kasparov and Nigel Short by Mr Brian Clivaz the general manager of Simpson's. Once the bids are revealed Gary Kasparov and Nigel Short and their representatives will examine each one precisely to ensure that the very best bid for the world-wide benefit of chess is accepted. For further information contact Dominic Lawson on 071 405 1706 or Raymond Keene OBE on 071 228 7009.

Gary Kasparov, Nigel Short

As a result of Short's challenge to the world crown the media interest in Kasparov's trip was staggering.

On the deadline date of February 22, no less than three British offers emerged to stage the world chess championship match. One from Manchester, in support of its Olympic bid for the year 2000, and two more from London: a magnificent response. The only other bid was from Santiago de Compostella but the Spaniards failed to raise their offered prize fund of one million Swiss Francs. All three British bids dwarfed this, each one offering at least £1,000,000, in itself a record for a British chess event. Unfortunately, FIDE botched the bidding process and managed to enrage the players as well. With three interesting bids on the table they failed to consult the players properly and swiftly announced that Manchester, which had in fact offered less than their rival bidder, Channel 4 TV, would be the venue.

### February 26

In a dramatic press release, Kasparov and Short today announced to the world (see press release opposite) that they were withdrawing from FIDE's jurisdiction and reopening the bidding process themselves.

### March 20

The chess community, and indeed the world at large, was alarmed last week to hear of the flight from Belgrade to Israel of Jezda Vasiljevic, the mysterious Yugoslav money man behind last year's Spassky - Fischer match and the bogus Belgrade bid for the Kasparov - Short World Chess Championship. As Vasiljevic sped to Israel, his Jugoskandic bank, which had been offering 15% per month interest on hard currency deposits, spectacularly crashed in his wake, leaving enraged depositors helplessly storming the defunct branches.

Where does this leave Bobby Fischer? Fischer, according to Yugoslav sources, did receive his \$3 million share of the prize purse against Spassky, but did he wisely stow the banknotes under his bed in the Belgrade Intercontinental Hotel, or did he reinvest it at 180% per annum interest in the Jugoskandic Bank? We may never know. What is clear, though, is that the self-styled 'world chess champion' has been left stranded by his protector and may be unable to emerge from his haven in Belgrade without incurring the wrath of the US

Internal Revenue and FBI. These organisations would doubtless like to interview him on account of his sanctions-busting activities. Indeed, Fischer may have been an unwitting accomplice in a criminal coup by Jezda of Moriartyesque scope. There is a theory that Vasiljevic used his sponsorship of the Fischer-Spassky match to maximise his credibility with Yugoslav punters, who love chess, before embarking on his adventure of absconding with the profits.

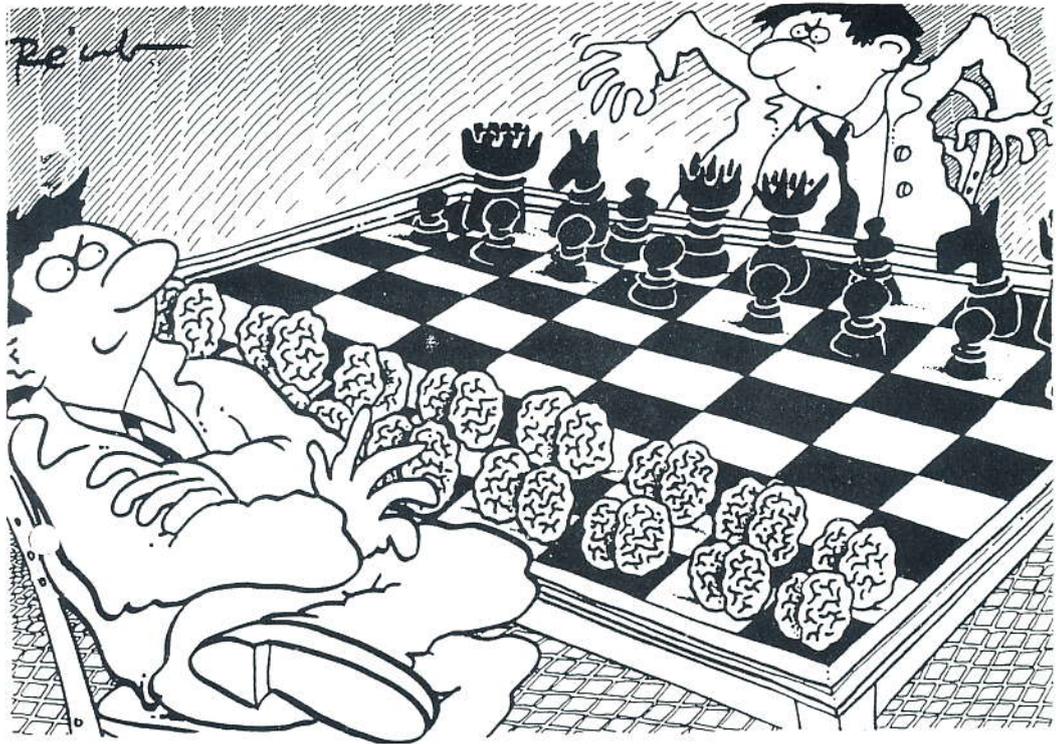
### March 27

On Monday, March 22 five new bids for the 1993 world championship were opened, amidst great fanfares, at Simpson's-in-the-Strand. One, a witty joke, offered 10 million Reichmarks as a prize, originally assessed at around £4 million, to gasps from the audience. It was rapidly ascertained that these were not current German Marks but a banknote from the period of post First World War hyper-inflation in Germany, worth roughly £200. There were four other bids: from the Brain Foundation, the Monsi Group, the London Chess Group and *The Times*, all offering prize funds from £1.2 million up to £2 million, considerably in excess of the bid from the Manchester organisation who, somewhat surprisingly, did not re-submit their offer.

### April 24

The £1.7 million bid from *The Times* has been accepted. Nigel Short and Garry Kasparov will contest a match for the world crown, sponsored by *The Times* and their partners Teleworld BV of Rotterdam, under the auspices of the Professional Chess Association (PCA), their own organisation. This embodies their own particular vision of how chess will be structured around the planet in the future. Ever since 1978, I have observed FIDE at close hand, first as a part of it, latterly as one of the governing body's most severe critics. There will doubtless be many excellent opinions from well-qualified people as to how the PCA should develop its vision. I would now like to offer my own suggestions as to how the PCA might operate in the period to come.

The first and most important plank is for the championship match between Kasparov



and Short to be organised in a splendid and impressive fashion. The chess world has been split between those expressing loyalty to FIDE and those who are enthusiastic for the new regime. Ideally, the coming match should help to heal the wounds and unite top chessplayers behind the new vision of what is possible. As an important part of this, the opportunities for promoting the game and bringing chess to an entirely new audience should be at the forefront.

Next, Kasparov, Short, and their advisors must turn their thoughts to the establishment of a regular qualifying cycle for PCA World Championship challenges. The existing FIDE cycle is already underway. Zonal tournaments have been held around the world and the next stage will be the Biel Interzonal to be held in the summer. Under no circumstances should the PCA interfere with, or even give the appearance of nullifying, the results of the FIDE Zonals or Interzonals. It would, however, be advisable for the PCA to be able to offer the ultimate qualifiers the opportunity to compete in the PCA's own Candidates competition. This would take the form either of a top tournament, or series of qualifying matches, with the ultimate goal of challenging the winner of the Kasparov - Short match.

For the next cycle the PCA will have to work out an entire qualifying system from scratch. One idea, which would satisfy both the elitist and the populist tendency, would be to organise a giant, open-to-everyone competition, from which qualifiers would

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*... opportunities for promoting the game and bringing chess to an entirely new audience should be at the forefront.*

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join strong grandmasters in a 100-player Interzonal. The winners from this, plus the loser of the previous championship match, would then contest either an elite tournament or knockout matches to decide the world championship challenger. This whole pattern would then be repeated for the future, probably on a biennial basis. Additionally, a most attractive new feature would be the introduction of a frequently updated ranking list for the top players. This could be published monthly (rather than twice a year, as with the FIDE rating list) and might well attract commercial sponsorship, as well as being a regular focus of attention for the public and the press.

Furthermore, the PCA's vision must not just focus narrowly on the financial interests of the top grandmasters. There is also tremendous scope for charitable work involving chess. This would involve bringing chess into schools world-wide, convincing governments of the educational value of the game, setting up specialist chess educational establishments (such as the Kasparov/Botvinnik schools) and teaching the benefits of chess to those who are physically and mentally handicapped. The canvas is global and the opportunities are glorious.

### May 15

The 1993 Kasparov-Short match for the world chess championship opens on September 7. Twenty-four games are envisaged, three each week, and 24 will be

played, come what may. A prize fund of £1.7 million, the largest for a world championship in a single venue, is on offer, split five-eighths to three-eighths in favour of the winner. Can Nigel win? His tournament record is vastly inferior to Kasparov's (as indeed it is to Karpov's) but Nigel excels at matches, having already despatched Speelman, Gelfand, Karpov and Timman in convincing style en route to this challenge. Fortunately, the championship is decided by match play.

Over the past eight years the chess world has been spoilt. There have been five great matches between Anatoly Karpov and the present champion Garry Kasparov. Karpov is the spiritual heir of the great consolidators and defenders, Steinitz and Capablanca. Even in the most precarious situations his eel-like defensive capacity has rescued him from the brink of defeat, while his powers of counter-attack are legendary. But in Kasparov he found a genius, the most dominant in the entire history of chess, who has repeatedly bested him. Kasparov loves risk, he relishes in the battle to the death, wrestling on the very edge of a precipice. But whatever risks he takes it is nearly always the opponent who plunges to his doom. For such a combative player, Kasparov's ability to avoid losing is extraordinary. Allied with his chessboard courage is a powerful memory, unbelievable calculating skill, in-depth endgame comprehension and a battery of prepared openings ideas

that would shame most chess databases. Clearly Kasparov will start favourite against Short this autumn. This perception is reinforced by Kasparov's impressive plus score against Short in tournament play, but in matches Short has fared much better. In their only previous head-to-head set match, also played in London in 1987 at the Hippodrome, Short lost four games but won two, a creditable performance.

### June 30

A unique series of competitions in London during the summer will transform the British capital into the mind sports Mecca of the world.

Garry Kasparov takes on prodigy Luke McShane (see Synapsia Vol 3 No 3: Brain Child) while the press looks on.



The most spectacular of these is the World Chess Championship sponsored by *The Times*. This will be backed up by an entire chess festival, with chess tuition by grandmasters, lectures and tournaments. Amongst them will be the annual Lloyds Bank Masters chess tournament, 21-30 August at the Cumberland Hotel, Marble Arch.

Powerfully reinforcing the Mind Sports Olympics theme will be the second World Memory Championships to be held at Simpson's-in-the-Strand over August 7-8. Last year's winner, Dominic O'Brien, will be defending his title against hungry opponents, some of whom have committed the number  $\pi$  to memory for the first 20,000 digits. Dominic himself can memorise a randomly shuffled pack of cards in 55 seconds. Amazing!!

The world championship match in chess, between Nigel Short and Garry Kasparov, is the jewel in the crown of the London Mind Sports Festival. Play will take place at the newly refurbished Savoy Theatre in London from September 7 to the October 30. Games will be on Tuesdays, Thursdays and Saturdays, with each game lasting approximately 6 hours. All 24 games will be played.

A brilliant new technological idea which will transform chess, the oldest game, into the most modern, for *The Times* World Chess Championship, is Predict-a-move. Every move in the championship can now also be guessed by hundreds of thousands of enthusiasts around the world, thanks to a stunning innovation developed by the Dutch technology and media experts Teleworld Holding BV of Rotterdam, who are *The Times*' sponsorship partners for the match. Everyone following the game will be able to make a prediction by telephone for every move.

Although media coverage of matches will be extensive, real time accurate information will be essential for Predict-a-move players. They will need to know the latest move and position of the pieces at any time during a game; they must be informed move by move. Fortunately, the games will be given



*Nigel's team: (from left) trainer Lubosh Kavalek, wife Rea, daughter Kyveli and mother Jean.*

in real time on teletext in most countries, or Minitel in France, where there is already a chess information service up and running. In addition to cash prizes, the Predict-a-move World Champion will be awarded a special live match against the winner of the Kasparov - Short match, and the Predict-a-move runner-up will play the World Chess Championship runner-up. The best players from each continent will play simultaneously against the World Chess Champion. This special one-day event will be staged within three days of the finale of *The Times* World Chess Championship and will be known as 'Kasparov/Short against the world'. Winners of the global Predict-a-move game will be flown to London for the games at the organiser's expense.

A particular bonus for this championship will be an amazing 60 hours of television coverage on Channel 4 throughout the United Kingdom. There will be three programmes every playing day during the match, as well as constant updating of the moves on teletext. This means that anybody who cannot visit the match in person that there will be guaranteed a virtual ringside seat for every game. The television coverage will be of a totally new and revolutionary nature. According to Rod Large, the executive in charge of televising the match the aim is to 'unzip the players' adrenalin' in a way never before attempted. Of course, there will be an expert television panel of male and female chess grandmasters providing commentaries on each game.

#### **Important information if you want to visit London for the Mind Sports**

If you would like to watch or play in the ever popular Lloyds Bank Masters, contact David Sedgwick on +44 81 656 7682.

If you want to participate in or spectate at the World Memory Championship and witness amazing memory feats, contact Tony Buzan on +44 628 475980.

For information about exciting and prestigious ticket and travel packages and events surrounding *The Times* World Chess Championship etc, ring the match organisation on +44 71 388 8223.

For information on the revolutionary Predict-a-move concept ring Roel Coert or Witze de Back at Teleworld, Rotterdam on +31 10 495 1066.

If you would like the innovative television coverage of *The Times* World Chess Championship to be screened in your country ring Rod Large of Telemotion on +44 81 748 4100 or fax +44 81 741 5515.



**Like the man in the advert, Professor Steven Rose says he has trouble remembering names and faces. This sounds paradoxical because memory is his business and his book, *The Making of Memory*, last May won the £10,000 Rhone-Poulenc Science Book of the Year Award. Tim Radford, science correspondent of *The Guardian*, reviews.**

# BRAINCHILD OF THE REVOLUTION

The title is not as metaphor. Rose who has held a chair at the Open University since its founding in 1970, is an explorer along what may prove to be science's last and most difficult frontier, the brain. A biochemist, he is in pursuit of the chemical changes that take place with the creation of each memory.

This is a tough assignment. The brain weighs about 1,500 grams and is packed full of nerve cells - there may be 100 billion or more - which interconnect with one another: each nerve cell can make 100,000 synaptic connections. Each thought, or fragment of a thought, or impulse to action, is signalled by a tiny electrical pulse fired by chemicals called neurotransmitters. There is, literally, an intellectual chemistry at work. Molecules of nitric oxide - this is part of Rose's work - play a role in the making of memory.

It has - thanks to decades of careful examination and the new technologies of scanning tomography and so on - become possible to think of a brain as a kind of machine. Wire up a volunteer to a scanner, and ask him to imagine turning out of his front door and stepping left, and then crossing the road: and you can plot the progress of his thoughts in false colour maps of the firing synapses inside his head.

But brains are not machines 'they develop' Rose says. 'They create themselves. We are dealing with at least twice as many cells as there are people in the world, and more possible synaptic connections than there are atoms in the universe. We are dealing with a self-generating machine, tremendously plastic.'

Although nerve cells don't renew themselves these connections are constantly being reformed in the plasticity of the brain.

'So it is a very strange sort of machine. And it is very hard to use the concept of information in the brain as you do in

computers, because you don't know what constitutes a bit of information,' Rose explains. 'We are really paddling round in a wealth of data and glorious pictures without any theory to go with it.'

There are people who insist on regarding the brain as a massively parallel distributed architecture computer. Rose is, he says, distinctly sceptical. 'What one has got in the brain is an extraordinary paradox of localisability and non-localisability: memories and information move around and are distributed across vast areas of the brain. Architecture computers don't work like that.'

Nor does memory. Memory has its own hierarchy, its own levels, its own taxonomy. There is a semantic memory which says that a year begins on January 1, and an episodic memory which records what an individual was doing on January 1. And even people who can't put a name to a face can recognise that they ought to be able to do so: show people photographs for 10 seconds and then show them pairs of photographs and ask them which of the two they have seen before and they will get it right. People will make up to 10,000 choices with 90 per cent accuracy when shown the photographs later.

There is a declarative memory that can put a name to, say a bicycle, and a procedural memory that can ride one. If you suffer from Alzheimer's disease, you forget the name. 'But you won't forget right to the end how to ride the damn thing,' Rose says.

Episodic memory goes through both a short and long-term phase: we discard material of use only for moments, because to remember literally everything would be a terrible burden (it would take you a whole day just to remember a day) and the stuff that is important gets stowed away in the mind's mysterious lockers, to be

summoned, deliberately or by some random process which seems like accident, in the oddest ways. These memories make us what we are. Without them, we are nothing. Rose says they define us more sharply than any other feature of our existence. But what are they? Memories are not like computer databases, with fixed information which can be added to or deleted: they are sometimes more like episodes of an impressionistic novel recreated afresh on each recall. This ought not to be surprising.

'If you assume - as we do - that memories are stored in the brain in some way as patterns and connections between individual cells, if you have got a constant flux of connections and pathways and activities running around in the brain you'll scan and pick up semi-random information of that sort.'

But how do you verify semi-autobiographical memories? 'I've got clear memories of my childhood but how do I "know" they are true?' Rose asks. 'Sometimes I can verify them by a photograph which fixes them in some sort of memory exoskeleton, but in other cases memory might be a con-fabulation. I say I am working on memory, but in fact, I am not. None of us are. I'm working on learning, or rather memory formation. We know damn all about memories once they are made, and still less about the process of recalling or forgetting them.'

Rose describes himself as an experimenter, but he is much more. His first book, *The Chemistry of Life*, written for the incomparable Pelican imprint 27 years ago, is still in print and still selling.

'I feel quite embarrassed about it. It has always surprised me, the number of times people have come up to me and said it changed their lives, it changed their careers. Someone sardonically said to me: you just wrote up your Cambridge biochemistry degree, and there is an element of truth in that'.

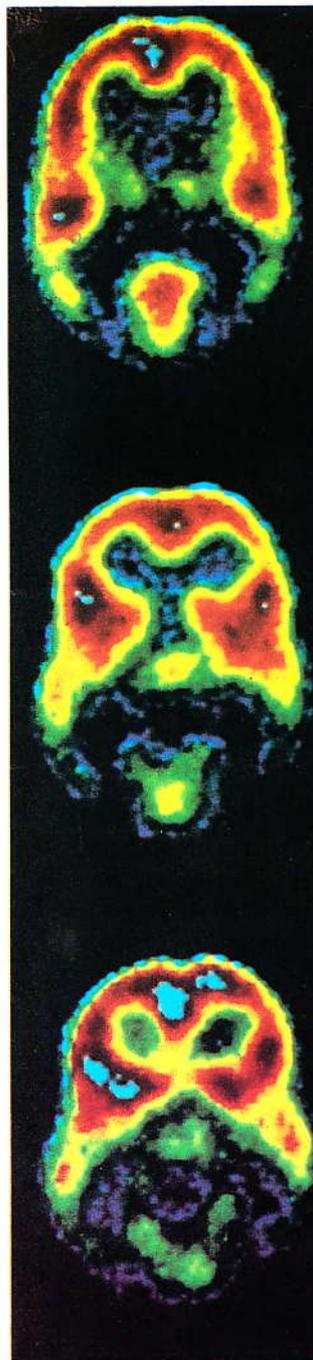
Since the late sixties Rose has been one of the awkward squad. Or perhaps one half of an awkward squad. He is married to Professor Hilary Rose, a sociologist at Bradford University, and the pair have, shot-gun style, fired both barrels at whatever they have seen as political abuse or misuse of scientific research. They were founder members of the British Society For Social Responsibility In Science, and Steven Rose is one of the more audible critics of the human genome

project: the £2 billion international effort to decipher the entire DNA code for a human being. His objection is that it reduces life to the level of molecular machinery, which might seem a surprising stand for someone whose whole scientific life has been devoted to understanding the molecular machine. All scientists are reductionist at the laboratory bench, however. Only some have elevated a working technique into a philosophy.

'A reductionist philosophy is a very bad way of understanding how biological living systems work. It's only part of a much richer picture,' he says. 'A reductionist philosophy produces some extremely dangerous ideologies of biological determinism, and some extremely hazardous technologies.'

He has also been a bitter critic of the

*Continued on page 24*



# THE MAKING OF MEMORY

From molecules  
to mind

STEVEN  
ROSE

# THE GREAT DIVIDE

**Why do we tend to respond emotionally to Beethoven's music but not to Schoenberg's? Does the answer lie in the very functioning of our brains? Paul Robertson reaches some astounding conclusions.**

Everyone recognises that music has a profound impact on the mind and on the emotions. Think how our pulses race when we hear a few spine-chilling chords in a Hitchcock film score, or our hearts swell to the sound of a military band. But until recently there was very little scientific examination of these different reactions. Now, assisted by sophisticated technology, we are beginning to get a glimpse not only of the manner in which we respond to music, but also how the creative process operates within the brain.

It was only nine years ago, in Switzerland, that it was discovered how the brain reacts to particular music sounds. Electrodes implanted just before surgery on the brains of patients suffering from severe epilepsy revealed that the left and right hemispheres of the brain respond separately to discordant (or clashing) and concordant (or harmonious) intervals. Discords such as minor seconds and major sevenths stimulate only the left, while concordant sounds (fourths, fifths, etc) excite the right side of the brain.

The major discovery of neuropsychology - or the study of the relationship between our brains and our minds - is that the two

hemispheres perform very different functions. Although the nature of these differences is still being defined, it is now established that in most right-handed people the left side of the brain is concerned mainly with verbal language, words, sequential reasoning and associated functions. The right hemisphere, by contrast, has no words and is concerned exclusively with our spatial abilities, emotions, 'intuition' and sense of rhythm. This hemisphere also invests our perception with meaning. (It is important to say here that being left- or right-handed is a separate issue. In only a tiny proportion of left-handed people is the speech centre located in the right hemisphere rather than the left.)

If the right hemisphere is damaged, we can still use words and respond logically, but speech will be colourless and monotone, bereft of tone, pitch and rhythm. The emotional level of thought also becomes literal and chillingly mechanical. For example, when a patient without a right hemisphere was asked how he was feeling, he replied, Dalek-fashion, 'With ... my ... hands.' Left hemisphere loss, by contrast eradicates speech, makes it difficult to form concepts and makes emotional self-control

impossible. The relationship between the hemispheres is subtle and complementary. The left is essential in the development of learned skills - reading, writing and so on. However, the acquisition of verbal skills (also the domain of the left) allows for new qualities of access to the right's emotional 'intuitive' insights.

### Left/Right Hemisphere Dominance

Through my work with Dr Peter Fenwick, consultant neuropsychiatrist to Maudsley and Bethlem Hospital, London, we concluded that the relative dominance of a hemisphere could indicate how the musical styles of certain composers develop. We realised that mainly intuitive composers, writing essentially emotional music, would use the rhythmic and concordant language of the right hemisphere, where meanings, emotions and rhythm are experienced. Those whose work was predominantly intellectual and logical would draw on the dissonant, arhythmic world of the left. So we drew up some composer profiles based on this model.

Schoenberg sprang to mind as a composer driven by intellect and dissonance. Words (left hemisphere) even motivated many of his earlier works. *Verklärte Nacht* is precisely based on a setting of a poem which was later removed from the music. This obsessive exploration of the relationship between words and music (left and right hemisphere) led to his *sprechstimme* (speech song, as found in *Pierrot lunaire*). His pioneering of the style of music known as serialism is largely arhythmic and dissonant (left). For this reason Schoenberg's mature music cannot neurologically offer emotional rewards to an averagely wired brain. Why then did he feel compelled to develop this dissonant style, which is so difficult for most of us to grasp?

We can hazard some answers. We know, for example, from tests performed both on highly trained choir boys and on children without musical education that musical training increases left hemisphere function. It is not surprising, therefore, to find that dissonant and intellectual music is almost exclusively the domain of the trained musician. It lacks the emotional qualities which makes right hemisphere music more accessible and popular.

Schoenberg actually expressed this

dichotomy with extraordinary clarity in his opera *Moses and Aaron*. Moses is a typical right hemisphere personality: a man inspired by divine, intuitive understanding, but handicapped by an inability to express himself in words. (Incidentally, Moses is reputed to have suffered from a speech impediment, which might suggest some left hemisphere deficit.) Aaron, however, was the communicator, the mouthpiece for Moses and plainly a left hemisphere type. Whilst Moses was communing with God on Sinai (the divine aspect of the right hemisphere), Aaron set up the golden calf, creating a physical, tangible substitute for true, intangible, inspiration - another indication of left dominance. When Aaron is destroyed, Schoenberg uses a single unison to describe the resulting wasteland - the sterility of the right hemisphere bereft of the skills of the left. This situation has reverberations today, living as we do in an excessively verbal culture. In fact, left hemisphere dominated music can leave us starved of emotional and spiritual nourishment leading us to question the validity of contemporary musical values.

A marked contrast is found in the work of a John Tavener, who uses sonorities and strategies essentially right hemisphere in nature. Such intuitive music should elicit a predominantly emotional response in the listener and because of its right hemisphere qualities is heavily invested with meaning.

### The Limbic System

However another specific area of the brain - the limbic system - offers us evidence as to how and why some music, such as that of John Tavener, is so spiritual in quality. It is by means of our right limbic system which lies deep within the brain that we experience 'emotional arousals' which range from sensual gratification to the most profound religious experiences. Neurologically, the two main factors that stimulate arousal are novelty and repetition. Repetition tends to diminish emotional response so that even a slight novelty immediately produces a marked heightening of arousal. For example, I am nervous about flying. After take-off the engine sound quickly retreats from my conscious awareness. However, even the tiniest alteration in its pitch triggers an immediate response of sweating and palpitations. This interplay between novelty and altered repetition is the major means of achieving limbic arousal. It is also an apt

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*We realised that mainly intuitive composers, writing essentially emotional music, would use the rhythmic and concordant language of the right hemisphere, where meanings, emotions and rhythm are experienced.*

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CULTURE CENTRE ? MANIPUL

FUTURE

THERAPY

ADVERT  
MUSAK

BEETHOVEN  
GLASS  
WAGNER  
ADAMS

BY USED

EMPATHY PHYSIOLOGICAL  
SHIFTS HORMONE

INTANGIBLE  
INTUITION



WORDS  
'MEANING  
RHYTHM



EASTERN  
SPATIAL  
EMOTIONAL

CONCORDANT

HARMONIOUS  
TONE  
PITCH

LIMBIC RIGHT

EMOTION AROUSAL

STIMULATE ALTERED  
NOVELTY

CLICHÉS  
REPETITION  
SYNAPTIC

SPIRITUAL  
SENSUAL

LATE  
ARTISING

MUSIC MIND 'INTELLECT'  
EMOTIONS ACCESSIBLE  
POPULAR

WILL?

INFLUENCED BY AGEING  
TINNITUS  
PARANOIA

DISCORDANT ('CLASHING'))))



WESTERN LOGIC  
LANGUAGE VERBAL

SEQUENCE 1 2 3 4

CONCEPTS  
LEARNED SKILLS  
MUSICIAN  
PROFESSIONAL

USED BY

TANGIBLE EXTERNALS  
SCHOPENBERG  
BOULLEZ  
BIRDMISTLE  
MAXWELL DAVIES

UAL  
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E PATHWAYS

## LEFT HEMISPHERE COMPOSERS

**Pierre Boulez** (b. 1925)  
A fierce polemicist and modernist, ever in search of a new musical language based on rigorous theory and a rejection of orthodoxy. His works include settings of poetry in which the words are treated as sounds devoid of meaning, as in his epoch-making *Le marteau sans maître*, setting the words of René Char.

**Harrison Birtwistle**  
(b. 1934)

The early violence in his work (*Punch and Judy*) developed into highly iconoclastic, slowly changing musical blocks with pulsing networks (*The Mask of Orpheus*).

**Arnold Schoenberg**  
(1874-1951)

His opera *Moses and Aaron* is a profound demonstration of the left/right hemisphere dichotomy. He pioneered serialism, or 12-tone music - music without a home key. Many blame him for the twentieth century's departure from 'tunes' in classical music.

**Peter Maxwell Davies**  
(b. 1934)

His opera *Taverner*, about the composer's mental battles, is fiercely expressionistic. Disintegration also shows in his use of foxtrots in the otherwise intensely serious *St Thomas Wake*. This use of dissonant language around clichés, familiar dance forms, creates novelty, which is attractive to the limbic system.

image to describe fundamental musical strategies.

Tavener is an excellent example of a composer who uses repetition to create a 'flat' emotional state, where relatively modest novelties have a disproportionate emotional effect. The neuropsychiatrist Dr Steve Brown, who is also a cellist, recently conducted scans of brainwave activity on people listening to different kinds of music. Dr Brown suggests that part of the attraction and impact of contemporary contemplative music (such as Tavener's or Górecki's or Pärt's), may be that it creates emotional states traditionally explored by Eastern cultures. These may be an appealing antidote to our current cultural bias towards the left hemisphere with its constant bombardment by external stimuli.

### The Musical Clichés

The interplay between the repetitive and the novel is subtle, as is the role of the cliché. A cliché confirms listeners' expectations - it represents well-established synaptic pathways (synapses being neurological point of connection) in the brain. Clichés are vital to great music since they create a commonly accepted emotional base line and language. For example, cadences, the punctuating clichés of tonal music, can have an intriguing effect when invested with even the slightest novelty.

In classical music - that of Handel or Mozart, say - a high degree of comprehension in the listener is taken for granted and the resulting play of clichés is elevated and subtle. Jack Brymer describes his delight in discovering that the glorious opening phrase of the slow movement of the Mozart Clarinet Quintet, which has all the characteristics of a typical (clichéd) symmetrical eight-bar phrase, is in fact an 'impossible' nine bars in length, creating a frisson in a musically well-versed listener.

### Music and Physiology

There are other interesting areas of exploration. We know that musical stimulus creates a physiological response. Tribal drumming, marches and cradle songs induce memorable changes in pulse and breathing rates. Such music relies on this innate ability to create physiological empathy. Classical music can also reflect such a relationship: the slow movement from Beethoven's String Quartet Op. 59/2 superimposes a

'breathing' melody on a 'heartbeat' accompaniment.

In other respects, physiology and composition are also linked. Changes in hormone levels for example, will radically affect musical language. Janáček's unique mature musical idiom was developed under the stimulus of his obsessive attraction to the young Kamila Stösslová. In his second quartet, *Intimate Letters*, the frenzied ostinatos (right hemisphere) are almost unnaturally bright and aroused, whilst the musical syntax (left hemisphere) becomes increasingly tenuous.

In contrast, Fauré's late works (such as his String Quartet, serene meandering reminiscence through personal clichés) reflect beautifully his own ageing. The falling hormone levels of old age lead to lower levels of arousal, including a more objective view of life.

### The Personal Element

While some composers or particular works fall very clearly into the left or right category, others combine these processes with more personal elements. For example, the sixteenth-century composer Gesualdo veers from the concordant spiritual (right hemisphere) to agonised discordant chromaticism (left), clearly indicating a literally unbalanced mind.

A number of composers suffered brain damage, quite often as a result of having syphilis, which in its advanced stages affects the central nervous system. The musical language of Smetana's two autobiographical quartets offers a clear example. The famous high E of his First Quartet echoes a symptom of tinnitus and presages the deadly attack of syphilis. The Second Quartet was completed only a few weeks before his death in the lunatic asylum. It is miraculous that this disintegration allowed for the composition of this piece, supporting the idea that music has an integrating effect within the psyche.

A significant discovery is that one small area of the brain seemingly contains a total recall of music heard between the ages of eight and 11. For example, one patient with a lesion in this area constantly suffered unwelcome replays of the brass band music of his youth.

It is interesting in the light of this knowledge that so many composers have commented that their mature styles have been

based on their earliest musical experiences. It is possible that the storehouse of such musical memories (that we all have) is accessed more readily by the composer. Perhaps the interpreter's task is to uncover such memories. The act of uncovering the layers or hierarchies of creative memory lying hidden in the musical score can be revelatory.

As leader of the Medici Quartet I can recall many years ago we learned the Elgar Piano Quartet with Clifford Curzon who, before approaching the music, started by trying to understand the composer's psychology. He came to believe that it is an apotheosis of Elgar's early experience of improvising in the style of his father, who was a piano tuner. This was combined with other, later, influences such as Elgar's own salon music, his loss of religious faith and his reactions to the horrors of the First World War, all of which are woven into a deeply personal musical tapestry.

It must be acknowledged that such research is still in its infancy. But as these brain scans demonstrate, the results so far seem to have far-reaching implications. Already one could project a 'brave new world' scenario into the way it may be used. For example, manipulative music (such as that for advertising) is intended to maximise the potential for influencing the consumer. It is possible that, in the near future, this could be composed by computer programme to stimulate relevant areas of the brain. So

Muzak in car park, shopping precinct or cafeteria could be used subliminally to stimulate moods which could be exploited for commercial gain.

### The Science of Music

Composers and performers must inevitably change their musical attitudes in the light of such knowledge, and music therapy will be increasingly based on a scientific foundation. In my experience, most creative artists feel threatened by this type of exploration, fearing that revealing too much of the mechanisms of inspiration will somehow destroy it. I feel that this desire to remain self ignorant is essentially neurotic - a world filled with non-neurotic musicians would be fascinating indeed! The most encouraging and valuable aspect of this work will be to validate the role of music at the very centre of our culture. In theory, it could mean the end of the traditional review as found in *BBC Music Magazine*. All you would need to know what the critic felt when listening to a piece of music would be a few judiciously chosen brain scans to demonstrate objectively its effects. Now there's an interesting idea for us musicians ...

*Paul Robertson is a violinist and specialist in music psychiatry.*

*This article first appeared in BBC Music Magazine.*

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## RIGHT HEMISPHERE COMPOSERS

### John Adams (b. 1947)

Influenced by Steve Reich, his work uses novelty within repetition, organic development and incessant ostinato, for example, *Shaker Loops* and *Nixon in China*.

### Richard Wagner (1813-1883)

Like Debussy, Franck, Liszt, etc, his musical arousal is certainly closely related to erotic arousal. Depicts every shade of sexual love in *Tristan*. The 15 hours of the *Ring* are held together by leitmotifs alluding to character, concepts, ideas, etc, which carry the action.

### Philip Glass (b. 1937)

Repetitive, minimalist style structured through Eastern-style rhythmic cycles, creating a hypnotic and dramatic effect, e.g. his *Koyaanisqatsi* film score, *Solo Piano*, *Glassworks*.

### Ludwig van Beethoven (1770-1827)

The slow movement of string quartet Op. 132 is a perfect example of music with a complete absence of dissonance. However the finale of Op. 18/6 is a graphic description of his underlying manic depressive condition.



# MEMORIAD '93

## WILL DOMINIC DOMINATE?

**The first ever Memoriad, held in London in 1991, resulted in a win for Dominic O'Brien, who has since carved out a career for himself utilising his memory skills. With the second Memoriad imminent we spoke to Dominic about his preparation and his thoughts on memory. Dominic is 35 and currently lives in Hertfordshire.**

**S** Have you always had a good memory?

**D** No. It is only in the last five or six years that I have trained my memory. It started off as a hobby, but now it has developed into a full-time occupation.

**S** When did you first become interested in the idea of improving your memory?

**D** I first became interested when I saw an episode of *Record Breakers* on TV which featured Creighton Carvello memorising a pack of cards in 2 minutes and 59 seconds, and wondered if I could do as well. I developed a system of mnemonics for improving my memory and then discovered that the Greeks had been doing exactly the same thing 2000 years ago! It took about three months to perfect the system.

**S** Have you ever been surprised at a memory feat that you have been able to achieve?

**D** Yes. I hold the world record for the largest number of decks of cards (35) correctly recalled. When I saw the visual representation of the cards laid out on the table, I was astonished.

**S** You won the first Memoriad in 1991 - did that surprise you?

**D** I thought I had a good chance. I knew that Creighton was good at card memorising - I didn't know what his abilities were in the other fields.

**S** Do you make use of your memory skills in day-to-day life, e.g. names, appointments etc?

**D** Definitely. We live in a 'language of numbers': phone numbers, addresses, times, registration numbers etc. Connecting them to images of people (a mnemonic device) makes them much more user-friendly.

**S** Would you like to tell us about your experiences at casinos?

**D** My success at blackjack means that I have been banned from most places, although there are still one or two where I can play. I have just returned from a trip to Prague where, accompanied by a *Times* journalist and photographer, I played on 14 consecutive days in their casinos.

**S** With success?

**D** I don't think I will be welcomed back! In my 14 visits I won 12 times, broke even once and lost once (a Black Wednesday!). We made a good profit on the trip.

**S** What are your other interests?

**D** I relax by playing chess, golf and the piano.

**S** How much time do you spend training your memory?

**D** I train every day. Typically I try to memorise a 100-digit number as quickly as possible, or a pack of cards. I try to develop new schemes for committing numbers, objects or cards to memory. There is plenty of room for creativity here.

*Continued on page 22*

# MEMORIAD '93

**In October 1991 Dominic O'Brien was crowned World Memory Champion at the inaugural Memoriad in London. Synapsia was there to cover the event in full (Vol 2 Nos 3/4). Here we look ahead to the exciting programme of events for this year's event, which is being held at Simpson's-in-the-Strand on August 7-8.**

Could you memorise a 200-digit number? 12 packs of cards? 500 words? 100 names and faces? No? Well at Memoriad '93 the world's leading memory experts will be attempting to do just that.

After his success in the first World Memory Championship Dominic O'Brien will be attempting to retain his title. However, he faces fierce competition from Jonathan Hancock, runner-up in Memoriad '91, and Creighton Carvello, World Record holder in six pack card memorisation, in particular.

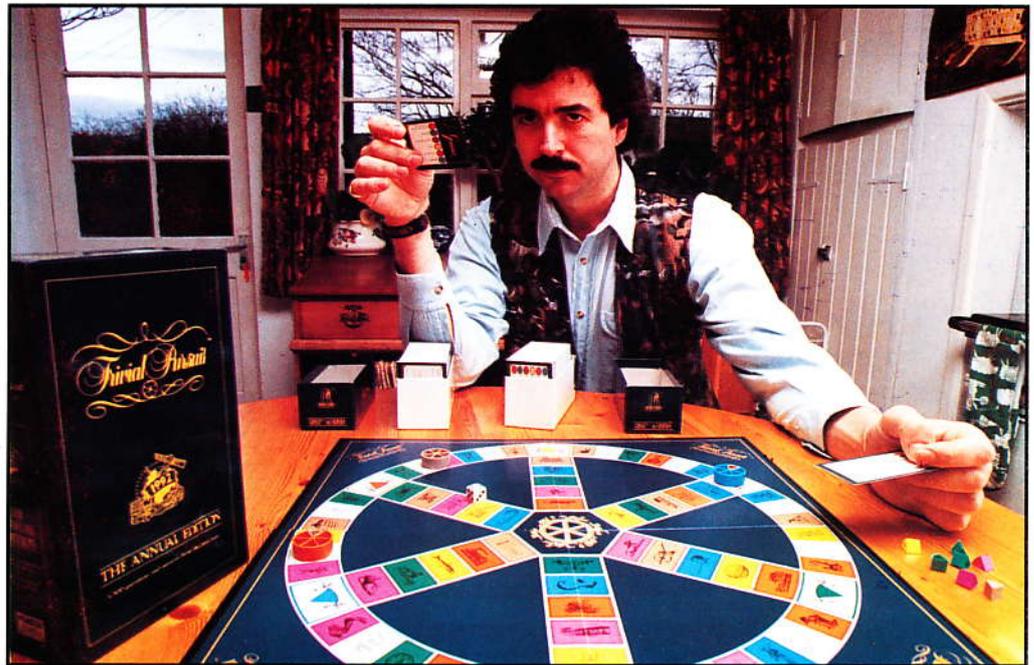
The first Memoriad involved a testing series of seven memory competitions: names and faces, numbers, random words, chess positions, written text, Chinese vocabulary and speed card recall. This year's event promises to be even more demanding for the participants. There are now eleven tasks for them to fulfil over the two days, testing all three major aspects of memory, 'sprints', 'middle-distance' and 'marathons'. The successful competitors will be rewarded with prizes donated by Encyclopaedia Britannica, the British Broadcasting Corporation, Viking Penguin and The Brain Club. The overall winner will be crowned with the prestigious title of World Memory Champion.

A whole host of special events are being held alongside the championship. Guest speakers include David Berglas, President of The Magic Circle, Brain Club President Tony Buzan, chess grandmaster Raymond Keene and Dr Elizabeth Valentine, Senior Lecturer in Psychology at Royal Holloway University, London. There will also be a special memory demonstration of 'The Knowledge' of London cabbies, chess simultaneous exhibitions and a range of supporting events.

For those unable to be present in person at Memoriad '93 *Synapsia* will be carrying a full report in the next issue.



Dominic relaxes by attempting to memorise all 6,000 Trivial Pursuit questions ...



**S** Do you do physical training, abstain from alcohol etc, when in preparation for a competition or for performing a memory feat?

**D** Yes. I stop drinking. I am not drinking at the moment in preparation for the world memory championships and I hope that the first drink I do have will be champagne to celebrate victory! I also jog and cycle. It is important to keep physically fit in order to

maintain maximum concentration for the two-day event.

**S** Which kind of memorising do you find the easiest, and which do you find the most difficult?

**D** I like all inanimate and abstract forms, e.g. numbers, faces, names. I am less keen on long pieces of text. I think I would find it difficult to memorise a whole book.

**S** What, in your opinion, is your most impressive memory feat?

**D** The 35 packs of cards. It took nine hours to commit them to memory. You

are allowed to go through them sequentially, at your own pace, but only once - you can't backtrack. It also took four hours to recall them. I recalled them all, making two spontaneous corrections. I recalled the first 1565 cards perfectly.

**S** What is the most impressive memory feat you have heard of?

**D** Pi has been memorised to 40,000 places. It is an ambition of mine to achieve something similar in this field. At the moment I am concentrating on speed records - this would be a much more long-term project.

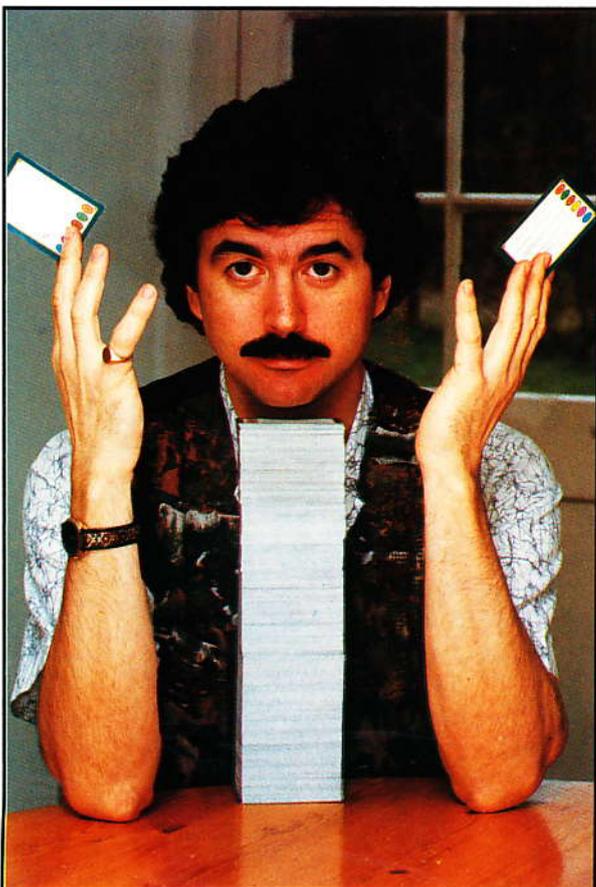
**S** Can anybody train their memory or do you think that a certain natural talent is required?

**D** I think anyone can do it to a standard that may appear to be very high, but is actually quite attainable. The memorisation of 52 cards is a good example. I think that most people have the ability to do this in five minutes. I don't think there is any real excuse, apart from mental difficulties, for not being able to achieve this. A target of three minutes is much more difficult. Anyone who could manage that is clearly very interested in making the most of their memory, and would be a serious contender in a memory contest.

**S** You recently broke the world record for memorising a deck of cards, doing it in 55 seconds. Could you tell us something about that?

**D** I set the world record of 2.29 at the first Memoriad in 1991. This was the first time

... mission accomplished!



since Creighton Carvello's appearance on *Record Breakers* that his time of 2.59 (achieved then) had been bettered. It was also the first time we had met. Creighton and Jonathan Hancock then nibbled away at my time, getting down to 2.16, 2.10 and then 2.05 etc. I wanted to regain this record absolutely, and so set myself the target of beating one minute. My initial attempts were of the order of 1.16 and 1.10, but on about the sixth attempt I managed 55.62 seconds.

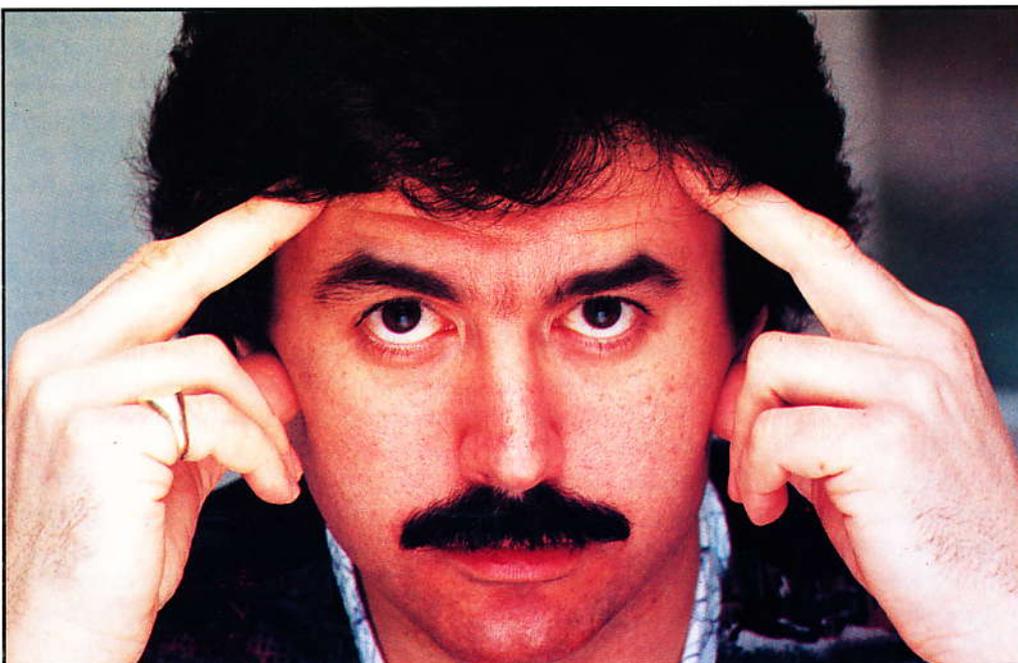
**S** Do you think there is a limit on how quickly this could be done, e.g. are 40 secs or 30 secs reasonable targets? Are there, in general, barriers to memory ability, or is the sky the limit?

**D** With reference to the playing cards example, the progress can come from memorising two cards at once instead of one. At the moment, I have a mnemonic of a person for each card and a journey on which I travel while meeting these people. For example, my mnemonic for the eight of diamonds is Richard Branson, and the journey might start off in my bedroom. Therefore if the first card is the eight of diamonds, I create an image of Richard Branson in his hot air balloon outside my bedroom window, before moving out into the bathroom to receive the second image. I am able to retain about one image per second and so, using this technique, it is difficult to progress much beyond 55 seconds. However, by

having an activity mnemonic for each card as well as a person, it is possible to connect two cards and thus only have to retain 26 images. For example, the activity image for the four of clubs could be shaving. Thus if the first two cards are the eight of diamonds and the four of clubs, I have to create an image of Richard Branson shaving and that can represent the two cards. This technique can be further refined to accommodate three cards in one clump. Thus if the third card is the queen of spades and the character associated with the queen of spades is Joan Collins, then the image of Richard Branson shaving Joan Collins can be decoded as three cards (*One can visualise possible distractions occurring with this method! - Ed.*). Then it is only necessary to recall 17 images for an entire deck of cards. I would guess that a speed increase of about 25% would be possible this way.

**S** How do you rate your chances for the coming event? Who are your main rivals?

**D** I am confident, but it is difficult to judge, as there are unknown quantities in the event. For example, three Turks have entered about whom I know nothing. Also, I think Creighton will be better prepared this time, but then again so will I!



# POETRY CORNER

**Chess Grandmaster  
Jonathan Speelman  
reacts to current  
events.**

## Murderers

*Did they have words for what they were to do?  
Or did they rather grunt their wickedness:  
Their syntax severed by the witches' brew,  
Which freed their muscles from their consciousness?*

*Who builds a tower of atrocities,  
Shall reap the Babel of bewildered rage.  
Each has seen murder in his own city.  
Each has his own defilement to assuage.*

*And blood shall bathe the burning of his head;  
And screams rekindle his dismembered power.  
And fire shall purge the canker of the dead.  
He shall build a better storey on the tower.*

*If they have words for what it is they did,  
Perhaps they starred as hero architects.  
The men who had the fortitude to rid,  
Society of venomous insects:*

*The cleansing others were too weak to dare.  
Were they heroic when they lit the fire?  
Was it nobility which stopped their ears?  
Could we but know: was it their finest hour?*

*Continued from page 13*

*'In the nineteenth century, scientists were by definition radicals. They were part of a tremendous progressive force which was changing the world.'*

harnessing of science for military purposes and he doesn't much care for the way science has become part of the machinery of established government.

'In the nineteenth century, scientists were by definition radicals. They were part of a tremendous progressive force which was changing the world.'

It's different now. Science is funded with profit in mind, and military advantage. Chemistry has always been the commercial science. This century, physics became part of the power structure. For decades, biology remained concerned either with evolutionary understanding or medical advance, but in an incredibly short time it has become part of a huge, competitive commercial enterprise. Even Rose's own field.

'Every step along the path of molecular biology has been one in which people began with high moral principles and ended up by cashing their cheques in', he says.

He mentions the late C. P. Snow's definition of scientists as men with the future in their bones, and grimly rephrases it: they are now the men who create a future with radioactivity in everybody's bones. He

thinks the nation - and its scientists - has it wrong.

'If you asked a tough question about Britain - "What would be the most efficient way of ensuring the welfare of the maximum number of children" - I would do something about the fact that the perinatal mortality rate in Bradford or Liverpool is about four times what it is in Cambridge. That's not inevitable, and it's not genetic. It says something about conditions and hospital facilities. By concentrating on magic bullet technology and the genome programme, we are getting the priorities wrong'.

The brain is sometimes referred to as grey matter, or the little grey cells. In fact, although the fibres below the cortex appear white because they are sheathed in myelin, the brain only appears grey when it has been pickled for a long time. When you look at a fresh, working living brain, it is quite pink.

*The Making of Memory: From Molecules to Mind*, by Steven Rose (Bantam, £16.99)

This review first appeared in *The Guardian*.  
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# INTELLIGENCE ABOUT INTELLIGENCE

## *First steps in intelligence*

### **Memory**

Traditionally psychologists have held that infants cannot store memories until they have the language skills necessary to form and retrieve them in the same way that adults do. At the University of Denver psychologist Marshall Haith has spent the best part of four years testing this theory. His experimentation involves placing babies into large black boxes where they lie and look up at television screens showing sequences of colourful objects. He then observes the infants' eye-movements using an infra-red camera connected to a computer. Haith has discovered that it only takes five tries for a baby to predict where the next object will appear, and after a little practice they can predict a four-step sequence; most can even retain this ability for another two weeks. According to Haith: 'The babies are not just looking. They're analysing, creating little hypotheses.'

In experiments at Rutgers University, involving the use of mobiles above a baby's crib, psychologist Carolyn Rovee-Collier has similarly found that babies can remember surprisingly intricate details: 'What we've learned is that even at two and a half months, an infant's memory is very developed, very specific and incredibly detailed'.

Another psychologist, Rachel Clifton at the University of Massachusetts, placed six-month-old infants in a completely dark room with objects that made different sounds and, also using an infra-red camera, observed how and when they reached for the objects. She then returned the infants two years later, along with a control group of other two and a half year olds, and was surprised to discover that they exhibited the same behaviour as before whereas the control group rarely reached for the objects. It would appear from Clifton's research that an infant's experience at six months can be remembered a full two years later!

### **Mathematics**

However, babies are not just proving adept at memory tests, psychologist Karen Wynn,

at the University of Arizona, has discovered that infants as young as five months have exhibited 'a rudimentary ability to add and subtract.' Wynn's research involved using Mickey Mouse dolls and a screen, revealing a single extra doll each time she raised the screen. She found that when she revealed the screen with an unexpected additional doll the babies stared longer at them longer than if the 'correct' number of dolls was revealed. Wynn suggests that they have a numerical understanding which is 'an innate mechanism, somehow built into the biological structure.' While it may be that the infants are perceiving things without knowing what they are perceiving, Wynn is convinced that: 'A lot more is happening in infants' minds than we've tended to give them credit for.'

### **Language**

Patricia Kuhl, at Seattle's University of Washington, has demonstrated that babies can sort through a jumble of spoken sounds in search of the ones that have meaning long before they actually begin to learn words. By the age of just six months, Kuhl suggests, babies have become specialists in recognising the speech sounds of their native tongue, and at eight or nine months comprehension is quite visible (babies would look at a ball when their mothers said 'ball' for example).

### **Able Babies**

As we have seen, recent developments in child psychology suggest that infant intelligence is a lot better developed than traditionally believed. However, the psychologists involved in these studies warn against 'hot-housing' children: 'Most of us agree that an infant could be taught to recognise letters and numbers. But the problem is that parents who do programmes [such as those at the Institute for the Achievement of Human Potential in Philadelphia] start investing a lot in their infants and become bound up in their success. It puts great strain on the infants and their parents,' says Carolyn Rovee-Collier.

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*It would appear from Clifton's research that an infant's experience at six months can be remembered a full two years later!*

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# AMAZING MEMORY STORIES

*How Antonio the librarian became the library*

*To his utter astonishment, the young Antonio wrote out the entire book for him, transcribing perfectly every single word, and every punctuation mark, as if he had been copying from the original.*

On 29 October 1633, in Leonardo de Vinci's town of Florence in Italy, Antonio de Marco Magliabechi was born.

His parents were poor, and were unable to provide him with any formal education, and so he was apprenticed to a local fruit dealer. In the shop Antonio spent his spare time reading and studying sheets of paper from pamphlets, journals and books that were used to wrap the groceries.

One of the regular customers of the grocery shop was a local bookseller who marked with interest young Antonio's attempt to read and understand the strange print before him. The bookseller took him to his shop, and was amazed to find that Antonio could almost immediately recognise, remember and identify all the books in his shop after only a brief familiarisation with them. With the bookseller's help, Antonio eventually became literate and began to combine his reading ability with phenomenal memorising techniques that enabled him to remember in its entirety nearly everything that he read.

## Overcoming the Sceptics

A sceptical author decided to put the lad's growing reputation to the test, and gave Antonio a new manuscript that he could in no way have seen before. Antonio read the manuscript with remarkable speed (a good memory does help you to read faster, and reading faster does help to improve your memory) and returned it to the author immediately, confirming that he had read it. The author had laid a trap for Antonio, for his plan was not simply to have Antonio read and comment upon the book, but was secretly to test Antonio's memory.

A little while after the event, the author pretended that he had lost his book, and asked Antonio if he could help him remember some of it in order that he might reconstruct it himself. To his utter astonishment, the young Antonio wrote out the entire

book for him, transcribing perfectly every single word, and every punctuation mark, as if he had been copying from the original.

As time went on, Antonio read and memorised increasingly large numbers of books, and eventually became so famous throughout Italy and Europe that experts in all fields would come to him for source material in their own areas of interest. Whenever they asked him questions, he would give them answers by quoting from the books he read, word for word, punctuation mark for punctuation mark, page for page.

As his reputation spread, so did his wealth, and he was eventually hired by the Grand Duke of Tuscany to act as his personal librarian.

## Speed-Reading

In order to be able to handle the gigantic volume of material contained in an entire library, Antonio decided to develop his speed-reading abilities, and apparently took this to almost superhuman dimensions. Reportedly he could simply 'dip' into a page, apparently absorbing the contents of an entire page with only one or two visual fixations, much to the wonderment of those who he happily allowed to watch him. (Modern research into the eye-brain system and to speed-reading possibilities is increasingly confirming that what Antonio developed is a natural skill available to all of us.)

Like Bidder and others, Magliabechi continued to develop his abilities as he progressed with age; the more he learnt, the more easy learning and integration of all subjects became. He was literally getting better and faster as he grew older, and in his later years the story spread of him lying in bed surrounded by volumes of books, which he would devour with gusto, memorising each one in turn until he fell peacefully to sleep. This he did until his death at the age of 81.

*Synapsia suggests that readers might like to duplicate the experiments and methods given in Amazing Memory Stories in their own lives and studies. We would also love to receive your own contributions about either personal amazing memory stories or those of others.*

# ANIMAL INTELLIGENCE

## *Super-learning squids and mental molluscs*

### **Octopus see – Octopus do**

The octopus has a surprising intellectual ability, report brain researchers Graziano Fiorito, a neurobiologist at the Stazione Zoologica, a marine biological research centre in Naples, and Pietro Scotto of the Università Di Reggio Calabria.

Learning by observation is considered a particularly advanced form of learning - one that is possible, some argue, only in a brain almost on the verge of conceptual thought. Such mental capacities have been thought until now to be the territory of only 'higher' vertebrates such as mammals, and *not* probable in the brains of invertebrates like the octopus, which is classified with slugs and clams as a mollusc.

Copying a model, a skill both basic to and advanced in humans and other vertebrates, is related to the content of abilities of the learning system of more advanced species. Stazione and Pietro performed a simple experiment involving *octopus vulgaris*, the common octopus found throughout temperate and tropical seas. Like all octopuses, its body is entirely soft. The largest specimens measure approximately three metres (ten feet) from the tip of the head to the end of the longest of the eight tentacles.

### **The Experiment**

In the first stage of the experiment, an octopus was trained to swim towards one of two different coloured balls placed in its tank. If the red ball was the 'correct' one, and the octopus went to the white ball, it received a mild electric shock. If it went to the red 'correct' ball, it was rewarded with a piece of fish hidden behind the ball.

Once the octopus had worked out the system, and was able to go to the correct ball every time, a totally untrained octopus was placed in the adjacent tank so that it could watch the trained octopus once again choose the correct ball.

The observing scientists observed that the observing octopuses watched the trained octopuses very closely, both their

heads and eyes tracking the action intently. It is known that octopus eyes can focus at varying distances to provide highly acute vision.

The observing octopuses were allowed to watch the trained octopuses perform four times, watching throughout as their neighbours found food and ate it. After this the observer octopuses were isolated and given the same choosing task, though without either reward or punishment.

The scientists were surprised to find that the observers, in most cases, followed their trained companions perfectly. Octopuses that had been trained by humans took an average of nearly nineteen trials to go to the correct ball consistently. The research both confirms the fact that the octopus has the most complex brain of any invertebrate, and also the many reported stories that they also know how to use it!

### **Mental Molluscs**

Further confirmation of the intelligence of the octopus comes from J. Z. Young from the University of Oxford in England. Young has found that the octopus's memory functions are organised very similarly to the memory functions of mammals. Young discovered also that octopuses can take in many kinds of specialised information and then generalise from those specifics in a way that allows them to make appropriate decisions when faced with novel situations.

Young's findings confirm those of aquarium keepers, who regularly describe octopuses as being curious, bright and easily trained. The keepers report that the octopuses show great interest about what goes on in the room outside their tank, and report also that they have been known to crawl out of the tank and into another if that other contains potential prey. Many of the keepers have openly wondered whether it was they who are conducting experiments on the octopuses, or whether it was the octopuses conducting experiments and observations upon them!

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*Many of the keepers have openly wondered whether it was they who are conducting experiments on the octopuses, or whether it was the octopuses conducting experiments and observations upon them!*

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# Drawing is Natural

**The front cover of the last issue of Synapsia featured the master work 'Star' by Brain Star Lorraine Gill (BCM 49). This master work heralds the beginning of a regular feature in Synapsia by Lorraine for all those Brain Club members who wish to learn to draw.**

**Lorraine Gill was born in Australia, travelled internationally, and is now living and painting in England. She has already had ten one-woman art exhibitions, featured in three books on great personalities and artists, appeared on BBC television in a programme on Sir Henry Moore (who did a documentary programme on Cezanne) and has written two books: *The Nature of Perception* and *How to Draw*. Synapsia is pleased to present a great artist in written as well as visual form!**

The countless times people have said 'If only I had been taught to draw at school!' The countless times people have proudly pointed out that they have a relative who has a natural ability as an artist but that they themselves do not even know 'how to draw a straight line'.

I don't know any person who can draw unaided, in one motion, a perfectly straight line, though there are bound to be some who may have practised this art specifically. But I do know, after many years of experience with persons from all walks of life, the following definite truth: anyone who wishes to, can draw.

It is a pity that 'Art', in many of our thoughts, is equated to something 'out there': something that people are born with, instead of being thought of as it is - a learned skill.

All of us are specialists in something we can teach others; simple for you, difficult for me. Did you drive a cab at five years of age? Could you cook a meal for seven at eight? Welding, building, sewing, writing, speaking, composing - you name it, all skills are learned.

Most of us are not born into families which foster an artistic ability from an early age. Yet one of the first instincts for a child coming to grips with the outside world is to make marks, whether it be scrawling on walls or on paper. A child tests its own understanding of the universe around it predominantly by the use of imagery.

Only later, if he or she is not progressively guided into further skills of imagery and mark-making, does an awesome inhibition arise about making

marks on paper; especially of making things 'look like wot they are supposed to!' Simultaneously there grows a deep feeling of awe for those who can.

These articles are for the child you left behind.

## Drawing is Natural

Whether we like it or not, life is series of rules: gravity, oxygen, nutrition, sensory-data-intake; alphabets by which we negotiate our lives. The essence of most things is simplicity.

Once we have acquired an alphabet, it is then taken for granted: stop at a red light; green for go; no parking signs and so on. The entire environment vibrates with visual information: a code; an alphabet; and for the blind, a tactile, feeling alphabet - where touch and sensibility 'informs' the person about where he or she is.

Nature is awesome: imagine yourself as a planetary being (which you are) designed to function within your environment. Two eyes horizontally placed connect your brain which at every waking second is coding information around you - visual data. If it did not we would walk into walls, drop over cliffs - general chaos! There is an order by which nature allows us to function 'automatically' - for survival.

It may surprise you to think that making marks is a survival mechanism, a natural function through which children of all races meet. It may also surprise you to think that our buildings, pipelines, aeroplanes and cities come into existence only because human beings initially made marks.

Our common ancestors, through their

phenomenal early intelligences, made marks to organise hunting seasons and coded for themselves drawings of their environment, with animals and people as their alphabet; a series of rules for survival. A long way from today's attitude of 'Art' being separated completely from the tribe.

In our western world the written alphabet of words became the source of knowledge. Gradually making marks and a developed sense of seeing and perceiving became blunted, out of practice and 'automatic'.

This leaves a gap: a feeling that one would like to draw ('If only I were born with the talent' as it is said). Have you noticed yourself and others quake with fright at being faced with a blank sheet of paper and asked to draw something? Grown men tremble; women laugh or giggle. This terrible white sheet of paper has the teeth of judgement staring back at you; the entire world will know you cannot draw like Leonardo da Vinci; this instant; straight away. You may even make a mistake; and how can you live with that? Not being perfect like everyone else. What's more you are entirely responsible; no passing the buck this time; so we scrunch up the paper and hide - or better still flush the incompetence away and **NOBODY KNOWS!**

You *can* DRAW. To start you on your new career as an artist, try the following simple visual exercise to help you test your perception of the world around you:

1. Look for patterns in your immediate environment.
2. How many rectangular objects can you see (it would be interesting to write the number?)
3. How many circular?
4. How many square?
5. How many ellipses?
6. Look at the way light reflects patterns:
  - a) in glass
  - b) in shadows
  - c) in nature
7. Watch how light changes the colours around you.
8. Finally look at all the verticals about you; the horizontal; the diagonals.

It is quite extraordinary to perceive patterns around us that repeat themselves and to find that simplicity is indeed the basis of what 'appears' to be a complex jungle.

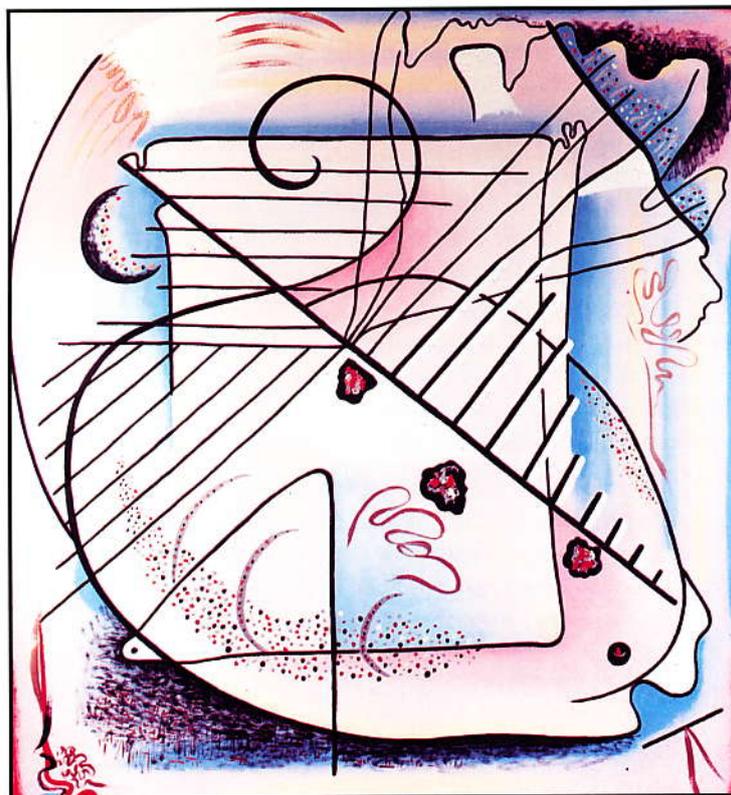
The painter Cezanne would ask for a hundred sittings from a subject: and always struggled to paint down these complexities into his visionary simplicity.

In the next issue of *Synapsia* we shall explore perspective and how to draw it.

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*It is quite extraordinary to perceive patterns around us that repeat themselves and to find that simplicity is indeed the basis of what 'appears' to be a complex jungle.*

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Sea Forms

## WILF'S MIND QUIZ

### No 1

**The questions below require some thought; try wrapping your brain around these teasers. Book prizes will be awarded to the three best sets of answers. Just send your answers, by September 30 please, along with your name, address and telephone number to Wilf's Mind Quiz No 1, Synapsia Magazine, 23 Ditchling Rise, Brighton, Sussex BN1 4QL. If you don't get every answer, take heart and send in what you can do anyway - your entry may still be among the best.**

1. Who wrote the following piece of dialogue, and where would you find it? (Clue: it is not in a novel.)

'Please write me a sonnet on the subject of the Forth Bridge.'

'Count me out on this one. I never could write poetry.'

2. Rossini wrote the original, and Mozart wrote its sequel - but Mozart died one year before Rossini was even born. What were the relevant works they wrote, and how did this reversal take place?

3. In Douglas Adams' *Hitchhiker's Guide to the Galaxy* (a trilogy in - currently - five parts) the heroes discover that the Answer to the Great Question of Life, the Universe and Everything is ... forty-two. Subsequently they discover the Question may be: 'What do you get when you multiply six by nine?' If this truly is the Question, what reasonable deduction can you make?

4. Speaking of forty-two: where in literature did a king have occasion to invoke rule forty-two? What was the occasion?

5. Not too long ago certain people in the UK would have found knowing the 23-times table an advantage. An Act of Parliament changed this so that knowledge of the 47-times table is substituted. What happened?

6. For years some scholars have found text in Shakespeare that 'proves' that Bacon wrote the plays; did you know that there is text in the *Authorised (King James) Bible* that could be used to suggest Shakespeare translated part of it? It's either an uncanny coincidence, or maybe ... Where is this proof?

7. What computer programming language is named after the first programmer?

8. Identify the fictional characters Wanda Seldon and Kathy Seldon. Are they related?

9. Remember S. T. Coleridge's Ancient Mariner? What connection does he have with San Francisco Bay?

10. John Wyndham (*Day of the Triffids*) and Lucas Parkes created the Troon family stories, gathered as *The Outward Urge* in 1959. What was unusual about this collaboration?

11. Who wrote *The Jewish War*, and in which language?

12. If you ever learned about the binomial theorem, you have certainly met with Pascal's Triangle: you know, the one that goes ...

```

      |
    | |
  | 2 |
 | 3 3 |
| 4 6 4 |

```

... and so on, where each number is the sum of the two above it. The question is this: to the nearest percentage, what proportion of the numbers in this triangle (extended endlessly downward) are odd?

13. What was unique about the performance for which Diane Keaton won her Best Actress Oscar?

14. One famous man once asked, 'What can you do with it? It's like a lot of yaks jumping about.' Who was he, and what was it that exasperated him?

15. Danny Thomas and Neil Diamond both failed spectacularly where another singer had previously succeeded. Where was this?

**Wilf Hey (BCM 854) is disk editor of *PC Plus* - a best-selling British computer magazine. He also appears in *PC Answers* (a sister magazine) and *Virus News International* (a specialist computer security magazine). He lives with his wife Barbie and two cats (Claudius and Nero) in Bath in the West of England.**

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# BRAIN CLUB NEWS

*Use Your Head?*

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## Change of Address and Staff

The office has just moved from Bournemouth to Marlow and sadly, this means our saying goodbye to Sally Shelford and Sue Price.

Sally and Sue have done a great amount of work in taking us through the third stage of development of the club. We now have a superb administrative system on which to base the expansion of our membership. Thank you, Sue and Sally on behalf of all the members, especially those who have had personal contact with you.

## Give us your Views - Change of Name?

A number of people who have joined us have remarked that they would have joined more readily had they realised the nature and aims of the Club. To many, 'The Brain Club' suggests something highbrow, or purely medical, maybe connected with cancer research.

In university circles, James Lee has pioneered the use of 'Use Your Head' in the titles of groups or societies with a similar aim to our Club. We are considering using that name ourselves - **what do you think?** (*'Use Your Head' would certainly get my vote - Ed.*)

The advantages are: more descriptive of our aims; an intriguing name that promotes enquiries; a more modern sounding name.

### The Brain Trust Charity Duck Race

This event is being held on Sunday, September 12 on the stretch of the River Thames alongside *The Bounty* at Bourne End, Buckinghamshire. Spectators can park in the British Rail car park at Bourne End, walk along the footpath to the river and then cross the *new* footbridge to the towpath on the opposite side of the river.

There will be a noon launch from *The Bounty* and the finish is half a mile downstream. £1 will sponsor a duck and the first 50 ducks across the line win a prize. All money raised is in aid of The Brain Trust.

- Crazy Golf
- Food available
- 50 prizes
- Licensed bar
- Fun day out for all the family

### Annual Conference 1993 Mind and Body - 4 September, London

The working title of this year's conference is 'Mind and Body', and will prove to be a fertile day for provoking your thought processes on this most important connection.

The meeting will be for just one day, a Saturday, and in Central London so that attendance costs can be kept to a minimum.

Professor Tony Crawford will be there as will, of course, Tony Buzan.

**Venue:** close to Green Park Underground Station: Naval and Military Club, 42 Half Moon Street, off Piccadilly, London W1V 0BP.

**Date:** Saturday, 4 September 1993.

**Tickets:** £45 (paid-up members) £55 (guests). This includes a buffet lunch with wine or soft drinks, and morning and afternoon refreshments. Please contact The Brain Club if you wish to come.

**BRAIN OF THE YEAR 1993**  
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