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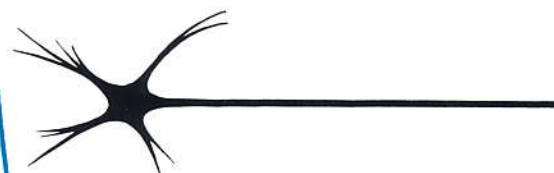
USE YOUR HEAD

SYNAPSIA

THE INTERNATIONAL

BRAIN CLUB JOURNAL

**LEARNING FROM
LEONARDO**



GAMES ISSUE

LEONARDO COMES UNDER THE HAMMER

ARABIAN KNIGHTS

MONOPOLY • WESTERN CAPITALISM AT PLAY

IT'S NOT ONLY A GAME

READING IN THE FAST LANE

USE YOUR HEAD EDITORIAL

Heading Forwards

Welcome to the Winter 1994 issue of *Use Your Head* and I hope you will enjoy reading this 'games' issue over the festive season.

I would like to take this opportunity to use this editorial to thank all the people who have helped out and contributed to *Use Your Head* over the past two years since I took over the job of producing the magazine. They are (in no particular order):

James Longworth for puzzle pages and other articles.

Lorraine Gill for *Drawing is Natural*.

Wilf Hey for puzzle pages and other work.

James Lee for *Use Your Head Club* information, Student Memory Championships report and general help.

Vanda North for *Business Brain*.

Neil McKee for *Mind Mapping* and the Joan Bland interview.

Sue Whiting for the Glenn Doman article and information for *Use Your Head Club* news.

Andrew Kinsman for numerous pieces and editorial work.

Brian Robins for design work.

Ray Keene for numerous chess articles, an interview, the World Memory Championships 1994 report and general help.

David Wilkie for an interview.

Dominic O'Brien for an interview.

Netti Pietkiewicz for *The Developing Brain* and general help.

Phyllida Wilson for news and general help.

Les Blackstock for *Gentlemen of Japan* (Shogi).

Lynn Collins, Teri and Lesley Bias, Lady Mary Tovey, George Nichols and Michael Roman-Pintilie for news pieces.

Warren Day for *Launching Your Mind into Space*.

Penelope Dablin for *The Mnemons are Coming*.

Cassandra Kinsman for typing.

Sean Kelly for poetry.

Pecub for brain cartoons.

The Marlow office for information and general help.

The Bournemouth office for information and general help.

Many thanks to all of you and profuse

apologies if anyone has been overlooked. If you would be keen to see your name on the thank you list at the end of next year, then please get writing your pieces.

Publication Dates for 1995

The four issues of *Use Your Head* for 1995 should be arriving on your doormats on approximately the following dates:

Spring - 20 March

Summer - 20 June

Autumn - 20 September

Winter - 20 December

Contributions to the magazine are always welcome. Copy deadline for articles is one month prior to publication date although, obviously, the earlier we get them, the more chance there is to get them in. Supplying material in printed form is appreciated and on a disk is even better (plain ASCII format).

In the Next Issue

Drawing is Natural - held over due to pressure of space (sorry Lorraine).

Interview with Ben Zander (see also *Use Your Head Club* news for details of Ben's forthcoming concert at the Barbican).

Late Brain News

Sue Whiting writes: The Radlett *Use Your Head Club* continue to meet on the 2nd Friday each month. In January, February and March, the emphasis will be on memory. If interested please contact Sue on 01923 853765.

Ian Docherty is keen to get a *Use Your Head Club* up and running in the Bracknell area. If you are in the vicinity and interested, Ian can be contacted at 15 Cressida Close, Warfield, Bracknell, Berks RG12 6UD (Tel: 01344 862075).

The *Running with Your Head* series has been put temporarily on hold due to the ill-health of Paul Collins, who we wish a speedy recovery.

Finally, best wishes to everybody for the festive season and we look forward to your continued support in 1995.

The editor welcomes contributions to *Use Your Head*. Please contact him at 23 Ditchling Rise, Brighton, Sussex BN1 4QL (or fax on 01273 675486).

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.

**USE YOUR HEAD Vol 5
No 4 Winter 1994**

Editor-in-Chief

Tony Buzan

Executive Editor

Byron Jacobs

Associate Editor

Andrew Kinsman

Editorial Board

Vanda North
Ray Keene OBE
Sir Brian Tovey KCMG
Lady Mary Tovey

Cartoonist

Pécub

Published by

The Brain Foundation
The Harleyford Manor Estate
Marlow
Buckinghamshire SL7 2DX
Tel: (0628) 482765
(inside UK)
+44 628 482765
(outside UK)

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The term and concept Mind Map referred to in this publication is a trademark.

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

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SYNAPTIC FLASHES

Latest Brain News

Einstein Ahead of Himself

Researchers have recently revealed that Albert Einstein devised his theory of relativity in 1912, three years earlier than previously believed. Scientific history books record that Einstein first publicly advanced his theory in a series of papers that were delivered to the Academy of Sciences in Berlin in November 1915, although they were not formally published until 1918. However, the chaotic state of Einstein's notebooks has until now disguised the fact that he correctly formulated the theory in 1912, but apparently initially rejected it as impossible because it contradicted the laws of conventional Newtonian physics. Researchers have had considerable difficulty in understanding the 84-page A5 notebook, written in Zurich, which is crammed with complex mathematical formulae in Einstein's own tiny neat hand. At one point Einstein appears to have stopped, flipped to the other end of the book and started again. The researchers' task was not helped by Einstein's secretary who stuck a front cover label over what is now believed to be the back of the book.

Back from the Drawing Board

Readers will recall the long-running story of Fermat's Last Theorem (Vol 4 No2) in which Wilf Hey related how Fermat's centuries-old conundrum had been solved by Princeton mathematician Andrew Wiles. When we last reported on the theorem (Synaptic Flashes Vol 5 No1), a flaw had been found in Professor Wiles' proof, and he was trying to repair it. The latest news is that he may well have succeeded. 'Most of us feel there is a very good chance it is correct,' commented Andrew Granville, professor of mathematics at Georgia University, after seeing a version of the corrected proof. The proof has now been submitted to the *Annals of Mathematics* for approval, which may take many months. However, since Wiles has now made it available to the mathematics community at large, any flaws should quickly come to light. The proof has no immediate practical application, but will,

if correct, guarantee Professor Wiles a place in the scientific history books, and may even lead to a Fields Medal, the equivalent to a Nobel Prize in mathematics.

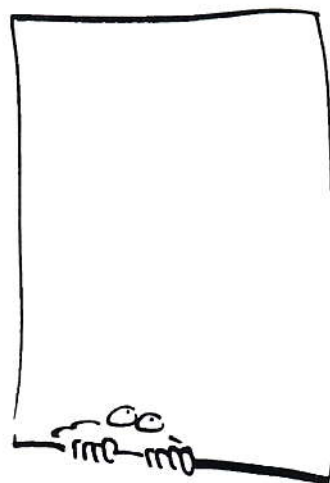
Luke Moves Forward

Luke McShane, England's great young chess hope, recorded another success at the Richmond International. Ten-year-old Luke defeated international master Klaus Berg of Denmark in their individual game and thus became the youngest British player ever to defeat an international master. This achievement followed hot on the heels of Luke's draw against Grandmaster Mainka from Germany at this year's Lloyds Bank Masters tournament. The only comparable performances outside the UK at such a young age are by Judith Polgar, the Hungarian teenage prodigy who has now, at the age of 18, advanced to claim a place in the top 25 players in the world.

Sir Karl Popper

Austrian-born Sir Karl Popper, the most important figure in the philosophy of science this century, died recently aged 92. His first major work, published in 1934 as *Die Logik der Forschung* and translated in 1959 as *The Logic of Scientific Discovery*, stressed the importance of 'falsifiability' as a defining factor of true scientific theories, and contrasted this with the untestable and irrefutable theories of Marxism and psychoanalysis.

His later *The Open Society and its Enemies* extended the critique of Marxism in a brilliant polemic which also attacked the idea that social scientists and historians can discover large-scale laws of historical development with predictive potential. Instead he proposed that progress could only be made by weeding out falsehoods through empirical tests and thereby avoiding the imaginative conjectures of theorists so that there is a continuous, though never conclusive, approximation to the truth. Popper was an excellent writer who regarded the clear expression of thought as a stringent moral obligation.



LEONARDO GOES UNDER THE HAMMER

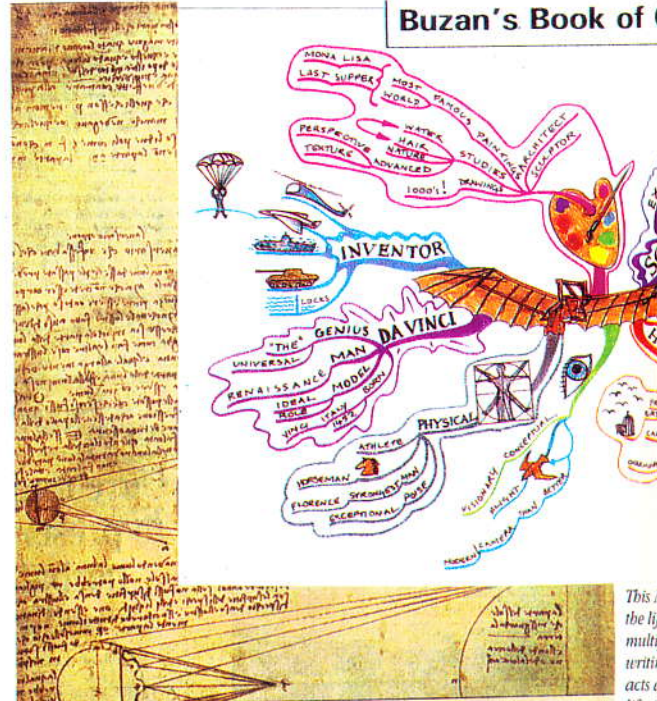
Leonardo da Vinci's legendary Codex Hammer, the illustrated 72-page manuscript that predicts the invention of the submarine and the steam engine, was auctioned at Christie's, New York, recently for the record price for a manuscript of \$30 million (£19.2 million). Leonardo wrote the manuscript by hand between 1506 and 1510, using his distinctive 'mirror' writing. It contains 360 illustrations on subjects such as astronomy and geology and explains why the sky is blue, why the moon glows and why fossil shells can be found on mountain tops.

Armand Hammer, the late former president of Occidental Petroleum, named the manuscript after himself after he purchased it in 1980 for £2.4 million from the Earl of Leicester. The Codex was auctioned by the Armand Hammer Museum in Los Angeles, and acquired by Bill Gates, the founder and boss of Microsoft, the world's largest and most successful software company.

This is a wonderful practical example of a facet of genius which is discussed at length in the *Book of Genius*. In this book, the authors identify a characteristic of genius which they label 'the mastermind group'.

'In our studies we have found no exception to the rule that great geniuses have internal role models or heroes - either from history, from those in the present but who are not personally known, or from myth. It is remarkable how many of the geniuses in this book had each other as role models and heroes.'

Leonardo da Vinci was fascinated



A 'Codex Hammer' page outlining Leonardo's theories about the moon

Private collector pays record \$19m for Leonardo's Codex

FROM BEN MACINTYRE IN NEW YORK

LEONARDO da Vinci's "Codex Hammer", perhaps the greatest work of scientific artistic genius, was sold to an anonymous private collector in New York yesterday for \$30.8 million (£19.2 million), the most ever paid for a manuscript.

The 72-page manuscript contains 300 drawings by Leonardo and provides a vivid insight into his prodigious genius, including his ideas on anatomy, mechanics, geology, astronomy. Christie's declined to identify the new owner, who bid by telephone. It was not immediately clear whether the "Codex Hammer" will leave America to be put on public display.

The Cariplo Foundation of Milan, backed by the Cariplo

Bank, pulled out at \$17 million. The bidding lasted three minutes as the price escalated by bids of \$1 million, quickly exceeding the initial estimate of \$10 to \$15 million and prompting gasps and applause from the audience. "Leonardo da Vinci belongs to our cultural history and obviously we wanted to get it back," Alessandro Alessandrini, a member of the Cariplo Bank, said. "It's a million-dollar investment."

The record bought by the oil tycoon from the Cariplo family. The Cariplo Bank offered for sale the Codex Hammer Museum in Los Angeles, established by Dr Hammer's descendants.

Compiled between 1510 in Florence and the "Codex Hammer" is ten times as large as the ten from right to left, day time to night, to reflect Leonardo's passion for art and science.



Leonardo da Vinci

Continued from page 5
The pledge after the event was to make the manuscript available to the public. The Cariplo Bank's decision to sell the Codex Hammer to a private collector is a reflection of the bank's interest in art and science.

Leonardo codex sold for record price

By Godfrey Barker in New York

LEONARDO Da Vinci's "Codex Hammer" of 1506-8 sold at Christie's New York yesterday for \$30,802,500 — the highest price ever paid for any manuscript.

The collapse of bridges in Milan were so confident they would capture "a treasure of Italy's national heritage" that they



This is the life of a multi-writer who acts as a life, it can be different use of aspects associated.

Microsecret

Cost of the book is \$15. The book is available in paperback for \$9.95. The book is available in hardcover for \$24.95. The book is available in audiobook for \$29.95. The book is available in e-book for \$9.99.

scientific research and particularly in anatomical drawings. It is thought that Leonardo dissected over 50 bodies to acquire his information. He climbed mountains, examining fossilized shells embedded in rocks, which caused him to question the theologically accepted date for the beginning of creation. His studies allowed him to devise methods of irrigation and water transportation. He drew relief maps, without the benefit of surveying instruments. He also designed innovative machines for war (in-

cluding an early tank) and invented a machine for grinding concave mirrors, which resulted in a telescope built in 1509 (a century before Galileo).

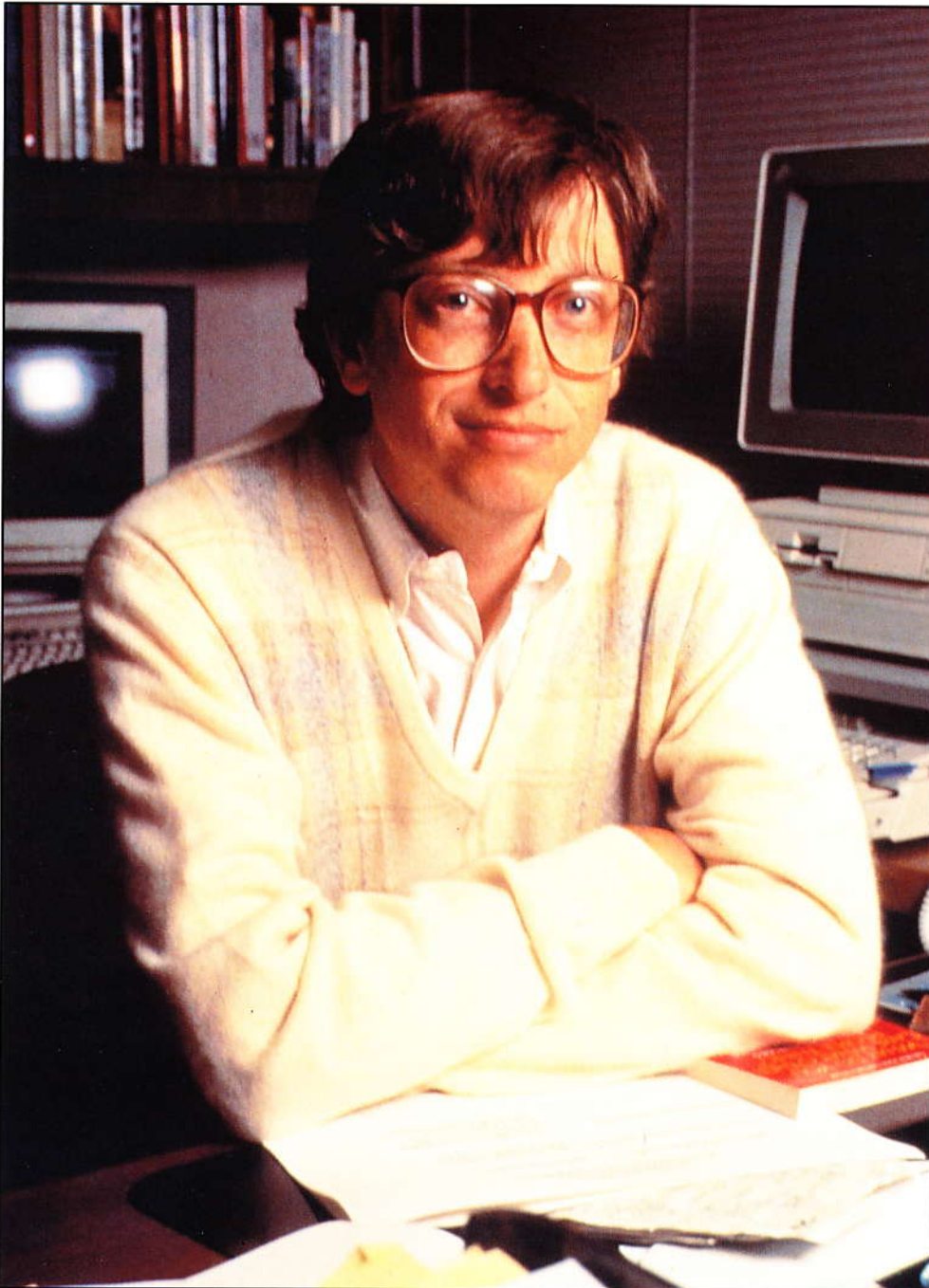
Microsoft boss Bill Gates' motto is 'I can do anything I put my mind to.' His faith in himself and his talent for writing computer operating systems has made him America's youngest billionaire. By enhancing computer operability, he is stretching the performance of these machines to their limits.

One feature that sets Gates apart from

Leonardo da Vinci - the ultimate polymath?

LEONARDO DA VINCI
FIORENTINO





The new owner of da Vinci's Codex, Bill Gates.

In January 1975, Gates took just five days to develop and write out an entirely new version of the computer language BASIC ... A conservative estimate for a standard expert team, working conventionally on such a task, would be six months.

other brilliant innovators of the past (such as, for example, Gutenberg, whose invention of printing was not matched by his business acumen) is his skill in operating his own financial affairs. Both intellectually and creatively 'MS-DOS' and 'Windows' software are the basis of Gates' fortune, but Gates had also earlier established Microsoft Corporation to his handle the business affairs.

In January 1975, Gates took just five days to develop and write out an entirely new version of the computer language BASIC for the Altair computer. He locked himself in a room of the Albuquerque Hilton for the entire period, eventually emerg-

ing with a pile of yellow legal pads covered in the new formulae and codes. A conservative estimate for a standard expert team, working conventionally on such a task, would be six months.

People who have had to deal with Gates often describe him as a perpetual teenager. Even though he is now 38 years old, it is the child-like joy in the brilliant speed, and sheer pleasure at his own inventiveness which has driven him on. Gates, who includes playing with earth-moving equipment on building sites at night as one of his favourite pastimes, has been labelled a workaholic. But, as with so many other high achievers, work to him is play.

ARABIAN KNIGHTS

Grandmaster Raymond Keene explores the history of the world's most popular mind sport and uncovers a fascinating problem.

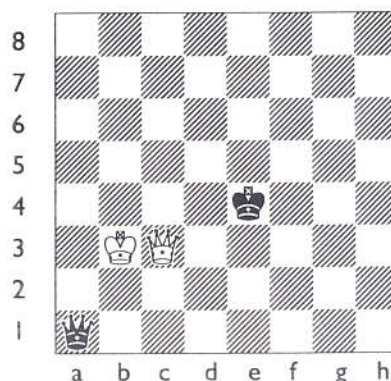
With Baghdad so much the focus of world attention over the past few years, it is interesting to point out that this city was once the world capital of chess. In the ninth and tenth centuries AD, Baghdad was to shatranj (the old Arabic form of chess) what Moscow is to the modern game. It was a cultured flourishing centre, packed with chess grandmasters and theoreticians who wrote volume after volume on critical positions and opening theory.

Early Grandmaster

The most renowned chess grandmaster in Baghdad was As-Suli (880-946AD). Just like Kasparov, he came from an area bordering the Caspian Sea and he used to travel to the capital from his far-flung outpost of empire to become the chess favourite of the Saddam Hussein of his day, the Caliph Al-Muktafi. In 940AD, according to the *Oxford Companion to Chess*, As-Suli made an indiscreet political comment and had to flee from Baghdad. He died in poverty in Basra.

Two of the key differences between shatranj and chess as we know it are that a win could be achieved by taking all of your opponent's pieces (apart from his king) while the queen (known as the firzan or vizier) was a comparatively helpless piece only able to move one square diagonally in each direction. Both of these points should be borne in mind for the diagram that follows, a study which demonstrates As-Suli's remarkable genius.

The position occurs in an ancient manuscript from Constantinople, which was written down in 1140. As-Suli said of this position: 'It is very old and extremely difficult to solve. Nobody, not even Al-Adli, could solve it, or say it is a draw or that White wins. In fact there is no man on earth who can solve it if I have not shown him the solution.'



Black moves and White wins

If it is White's move in this position he wins very quickly, as follows: 1 Ka2 (this isn't moving into check: remember, in shatranj the queen can only move one square diagonally at a time) 1...Kd3 (Black's defence is always a counterattack against the white queen whenever the white king sets off to hunt down the black queen) 2 Qb4 Kc4 3 Qa3 and White wins, since Black's queen is cornered, while White's queen is immune. However, in the diagram it is Black's move, and it is this factor that causes the extreme difficulty of the solution.

1 ... Kd5

If 1...Kd3 then 2 Qb4 and 3 Ka2 will win. If Black plays any other move at the start then 2 Ka2 wins at once.

2 Kb4 Kd6

3 Kc4

Not 3 Qd2 Ke5 4 Kc3 Ke4 5 Kc2 Kf3 6 Kb1 Ke2 7 Qc1 Kd1.

3 ... Ke6

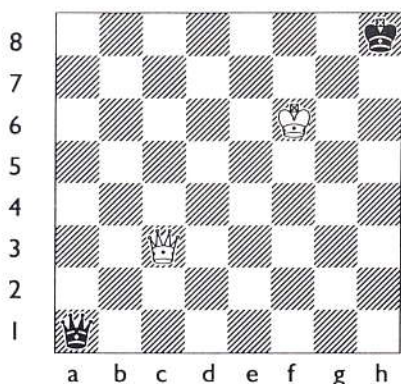
Plausible but incorrect would be 3...Ke5 4 Qb4 Kd6 5 Kc3 Kc6 6 Kb3 Kb5 7 Qc3 Kc5 8 Kc2 Kc4 9 Qd2 and White wins since he will quickly trap the black queen with his own king, while the black king cannot make contact with the white queen.

4 Kd4

If 4 Qb4 Black defends with 4...Kd7!! 5

Kb3 Kc6 6 Ka2 Kb5 or if 6 Kc3 Kd6 also with a draw. Black is defending by using the method of corresponding squares, generally regarded as a modern invention. The point is, for example, that if White's king is on b3 Black's should be on d6.

- 4 ... Kf6
5 Kd5 Kf7
6 Ke5 Kg7
7 Ke6 Kg8
8 Kf6 Kh8



The black king has been forced to h8, the furthest extremity of the board. By playing 9 Kg6 White wins the battle for the corresponding squares. For Black, the chessboard has become too small. The square which corresponds to g6 is i9, but it does not exist on the chessboard.

- 9 Kg6 Kg8
10 Qd2 Kf8

If Black plays 10...Qb2 to free his queen from its prison on a1 then the white king will rush back and capture it. Meanwhile, the white queen on d2 is well out of range of the black king on f8.

- 11 Qc1 Ke7
12 Kf5 Kd6
13 Ke4 Kc5
14 Kd3 Kb4
15 Kc2 Ka3
16 Kb1

and on the next move the black queen is lost.

The solution to this endgame study is amazing. Both kings run from one corner to the other and then back again. It is a creation of genius. Is there any modern endgame study which has such an advanced idea?

The appalling complexity and filigree subtlety of this wonderful endgame which As-Suli solved in the early tenth century makes it impossible for me to believe that

the game of chess was invented as late as 500AD. As-Suli himself calls this a very old problem and mentions that Al-Adli, who lived a century before him was already aware of it yet unable to solve it. Such sophistication in a game, given the limitations of civilised life at that time, especially the lack of printing, could not possibly have arisen so quickly.

Diversionsary Counter-Gambit

Chess was actually fortunate to have survived at all under Islam, since the game tended to violate two central prohibitions of the prophet, that against the making of images and that against gambling. The first objection was ingeniously circumvented by the adoption of abstract designs by the Arabs for their chess pieces. The problem of gambling on the result, which was rife, was more serious. The solution was a diversionary counter-gambit. Various chess-loving Caliphs announced that chess was a preparation for war and thus permissible. The problems concerning Islamic Law are, though, still very real. Only recently has the Rafsanjani regime in Iran revoked the Ayatollah Khomeini's prohibition against playing chess, while Western chess masters travelling to Saudi Arabia are generally advised against bringing in Western chess sets. The Christian cross surmounting the kings might cause offence to devout customs officials.

CHESS - KING OF MIND SPORTS

Mind sports play a vital part in the lives of many geniuses and, of the various occidental mind sports, chess is the king. It is the one practised most widely and has the most well-documented and carefully written theory to back it up. A number of geniuses have rated chess highly. Goethe called the game 'the touchstone of the intellect'. Haroun Al-Rashid, the Abbasyd Caliph of Islam (AD 786-809), the man idealised in the *Arabian Nights*, was the first of his dynasty to play chess. The 11th century Byzantine Emperor, Alexius Comnenus, was allegedly playing chess when surprised by a murderous conspiracy which, being a good chess player, he managed to escape!

The Aladdin of the fairy tale was, in real life, a chess player, a lawyer from Samarkand in the court of Tamburlaine. Tamburlaine himself loved to play chess and named his son Shah Rukh, since Tamburlaine was moving a rook at the time the birth was announced. Another genius, Benjamin Franklin, was an enthusiastic chess player - indeed the first chess publication in America was Franklin's *Morals of Chess* which appeared in 1786. Chess was mentioned by Shakespeare, Goethe, Leibniz and Einstein. Ivan the Terrible, Queen Elizabeth I, Catherine the Great and Napoleon all played chess.

MONOPOLY THE TRUE STORY

Monopoly, the game of pure western capitalism, is one of the oldest of the 'modern' games. Dan Glimne examines the history of the game and explores its enduring appeal.

Monopoly is 'as common as the fridge and the telly' in English homes. It has become the symbol of pure-bred Western capitalism, and it has therefore had more than its fair share of critics. One of the first things Fidel Castro did after seizing power in Cuba was to ban Monopoly and confiscate all existing sets on the island.

Despite incidents like this, upwards of 125 million Monopoly games have been sold world-wide to date. It is published in over 40 countries in over 20 different languages; two special Monopoly sets for use in zero-gravity have been made on request from NASA. In 1963, when the perpetrators of the great train robbery hid in a barn during the first 24 hours, they passed the time playing Monopoly with real banknotes - the

two million pounds from the heist! But who was the real inventor of Monopoly?

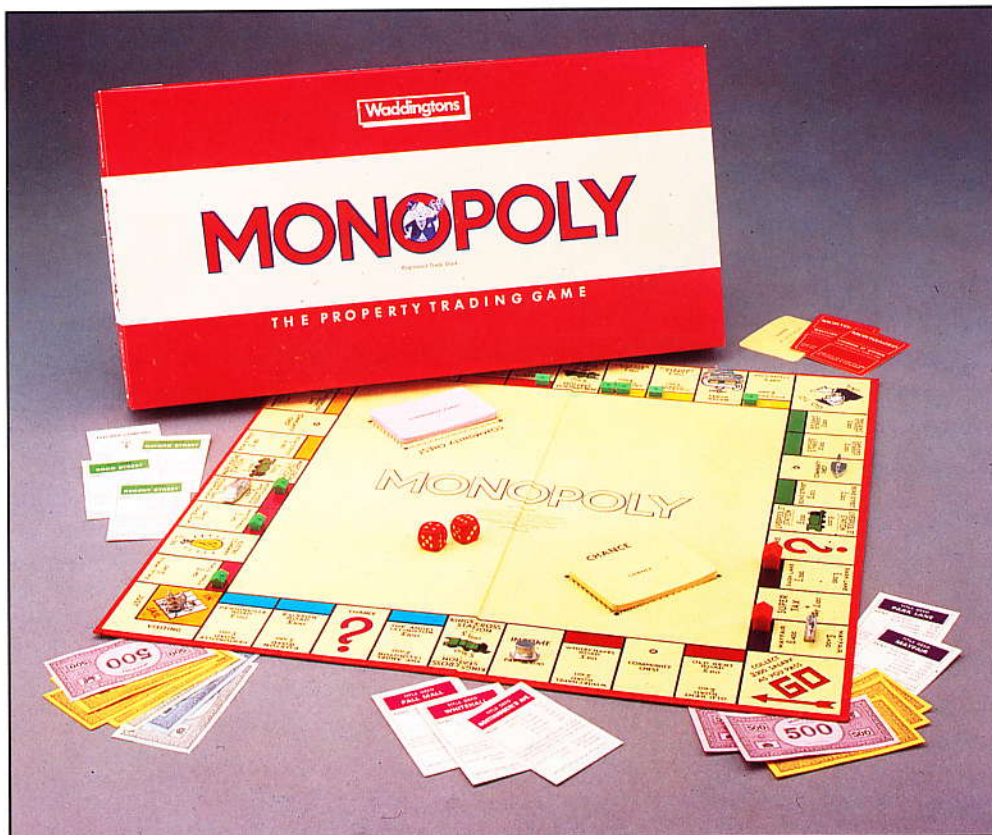
According to an oft-quoted tale, it was supposedly invented in 1933 by unemployed Charles Darrow in the USA depression, who thanks to his stroke of luck became a multi-millionaire and lived happily ever after. This is, however, a rather less than well-founded version of the truth.

The Woman behind it all

The real inventor was an American lady named Elizabeth Magie. On 23rd March 1903 she applied for a patent for her The Landlord's Game. It had a game-board with 40 squares along the edges, four railways, and property values that increased as one advanced around the board, just like the later Monopoly. A few differences also existed: there were no cards, the starting square was called Mother Earth, the properties had no names and you could not build houses and hotels on them. Thus no monopolies could be formed, which was exactly what Elizabeth Magie intended: she did not create her game in order to make money, but rather to serve as anti-capitalistic propaganda!

Magie was an independent and liberal woman for her day and a supporter of the economist Henry George, creator of the single-tax theory. The basic tenet of this was that property speculation forms the basis of society's economic and social problems. Magie created her game to show how unfair rents could be charged by unscrupulous landlords (which is why she included a Jail space on the game-

Monopoly - the world's most famous modern board game.



board; some small symbol of justice had to exist!). Magie's game was never properly published; she made up a few hundred copies by hand which were sold to friends and to a few shops in Maryland and Eastern Pennsylvania.

The Game becomes Monopoly

During the 1910's and 20's Magie moved in Quaker and university circles, where the game slowly spread in the form of hand-made copies which were gradually changed and improved. Someone hit on the idea of naming the properties after local streets, another came up with the concept of 'investing', using small markers which were put on the property squares, i.e. the fore-runners of houses and hotels, and a third invented the monopoly principle - the idea that you could divide the properties into groups and charge more rent once you owned an entire group. The game also started being known as Monopoly, despite the wishes of Magie who continued to insist on the name The Landlord's Game.

In 1924 Elizabeth Magie applied for, and was granted, yet another patent on the game with the above changes. The most important change had however crept into the game against Magie's outspoken intents: most people playing Monopoly by now saw it as an exciting business game, and not as any moralising over the woes of property speculation.

Charles Darrow 'invents' the Game

Charles Darrow, who really set the ball rolling and for decades afterwards was officially upheld as the inventor, came across the game for the first time in 1933. He was an engineer who like millions of others had become unemployed during the depression. One evening, he and his wife Esther were visited by two good friends, Jeff Raiford and Charles Todd, who brought with them a handmade copy. This had by now gone through further improvements: the Chance and Community Chest cards had been introduced, and houses and hotels could now be brought and erected on the properties. Raiford and Todd had copied their game from a lady, Ruth Hoskins, who recently had moved from Indianapolis to Atlantic City on the Eastern seaboard of the United States.

Charles Darrow became captivated by the game and quickly made his own copy.

The anecdotes

In 1961 there was a marathon Monopoly tournament at the University of Pittsburgh, during which the bank ran out of money. The students sent a telegram to Parker Brothers who, seeing the PR possibilities, sent bags of playing money to the university in a Brinks armoured truck escorted by armed guards! During a game of Monopoly in 1984 in a prison in Ashville, North Carolina, one of the convicts got into an argument with a fellow inmate player and got so angry that he swallowed a number of houses and hotels, whereupon he was taken to the local infirmary. The doctor who examined saw no reason for concern, but could not resist writing out a prescription saying 'Go Directly To Jail!'

Instead of introducing property names from Germantown in Pennsylvania where he lived, he kept the Atlantic City street names, probably because that city at the time was the premier American holiday resort. Ironically, he copied a misspelling that Ruth Hoskins had made on one property, Marvin Gardens instead of the correct Marven Gardens. One of the services Darrow performed for the game was, however, to draw a more attractive gameboard using his draughtsmanship skills. This design is still used to this day in American Monopoly. Even the misspelling is still there!

From Hand-Made Copies to World Success

Darrow had little respect for copyrights and intellectual property but did have business instinct. He managed to get 'his' version copyrighted and started selling hand-made copies for two dollars and fifty cents apiece, first to friends and relatives and then to local shops. He then submitted the game to Parker Brothers, then as now one of the leading USA games companies, claiming to have invented the game. It was turned down, for the reasons that the playing time was too long and the rules were too complex.

Darrow was not discouraged, managed to get credit at a local printing shop and ordered an incredible 5,000 games made up. They all sold out, to shops and department stores as far away as Boston and New York. Faced with this sales record Parker Brothers changed their mind and signed an agreement with Darrow. The first Parker edition appeared in the spring of 1935 and became the biggest games hit ever in the USA.

There has been much speculation on why Monopoly became such a success. Perhaps it was simply the right product at the

right time: in Monopoly you could temporarily forget the harsh reality of the depression and become a tycoon of high finance for an evening, the equal of the Rockefellers and J.P. Morgan. However, it came in the nick of time for Parker Brothers, who had been in business for over fifty years but were also hit hard by the depression. By autumn they were forced to increase their workforce and introduce weekend shifts to catch up with demand - by then over 20,000 games a week!

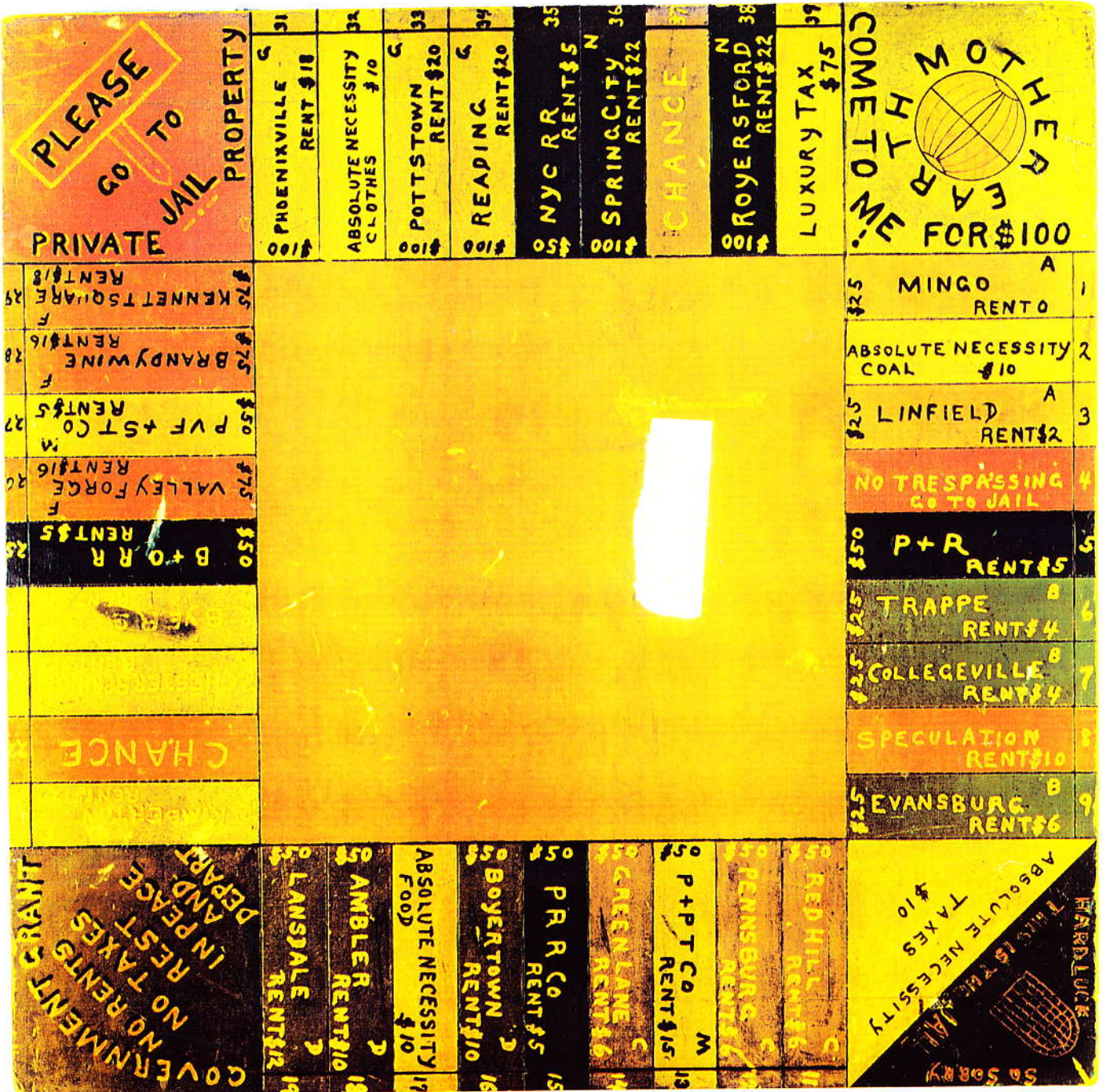
Charles Darrow's first royalty check was for over 7,000 dollars, a fortune at the time. He retired at 46, on his way to becoming a multi-millionaire. Until his death in

1967, he spent the rest of his life devoted to his hobbies, growing orchids and photographing.

A Nasty Surprise

Darrow also applied for a patent on Monopoly in 1935, which resulted in a nasty surprise for Parker Brothers: not only did Elizabeth Magie hold two previous and very close patents, but a small Midwestern company named Knapp Electric had already published a similar game called Finance in 1929. (The similarity was no coincidence; the 'inventor' Daniel Layman had copied his game from Ruth Hoskins' two brothers!) Parker belatedly realised that Darrow

A 1910 Monopoly gameboard.



was rather less than the inventor, and the company lawyer Robert Barton was saddled with the job of discreetly trying to keep the potential scandal out of the press. Barton managed to buy up all the rights to both Finance and The Landlord's Game (the latter for only \$500 from Elizabeth Magie!) as well as all the copies of both games he could find. The matter was thus hushed up, and well into the 1980's Parker stuck to the Cinderella tale of the unemployed but inventive fellow who hit upon the game idea of the century and became rich and famous.

The Game conquers the World

By the end of the 1930s the game was successfully licensed and sold in several European and South American countries, but was banned in Nazi Germany by propaganda minister Goebbels as being too 'Jewish-capitalistic'. The clique around Joseph Stalin had already banned the game in the Soviet Union as being 'a decadent instrument of capitalism'. Even today Monopoly is officially banned in China, North Korea and Cuba. It is, of course, a sought-after black market item.

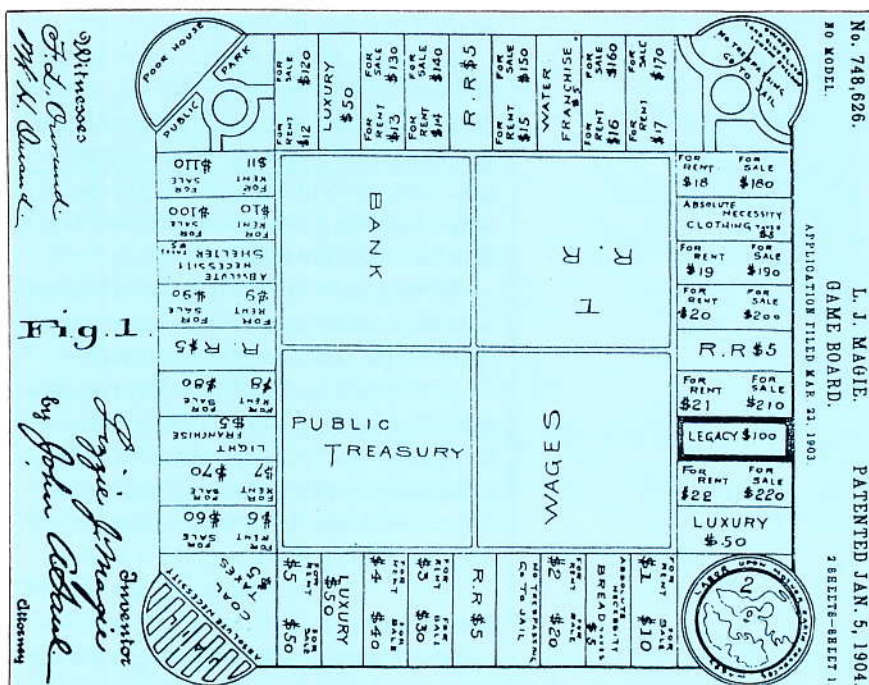
Ban or no ban, during World War II the Germans allowed Monopoly games to be sent to British POWs via the Red Cross. These rather special games, more or less unofficially commissioned by the War Office, contained various items not listed under 'Contents' in the rules sheet ... such as silk maps showing escape routes from the various caps, steel files, compasses and fake ID's, and German Reichmarks slipped among the playing money. Thus was given a new meaning to the phrase 'Get Out Of Jail Free'.

The Secret exposed

The 'adjusted' tale about Darrow and Monopoly might still be the official version of events today, had it not been for San Francisco economics professor, Ralph Anspach.

He objected to the multitude of business games glorifying monopolisation and produced Anti-Monopoly in 1973. A few days after it hit the shops Parker's lawyers conveyed their opinion. Anspach replied by counter-suing, and thus began a decade-long battle in various courts.

The feud received nationwide attention. In August 1974 Anspach was a guest on a TV talk show in Oregon, when a woman phoned in to say that the mother of one of



her friends had played Monopoly back in the 1920's. It was Anspach's first glimmer of a suspicion that everything was not as above-board as it was purported to be. He started unravelling the threads: patient detective work that would for the next two years have him travelling back and forth over the USA, taking down testimony and eventually getting hold of several old hand-copied game-boards.

Anspach was not the first person to start looking into the muddled history of Monopoly, but he was the most stubborn and successful. The result of his research appeared on front pages in several countries, a measure of the popularity of Monopoly. It also proved to be dynamite in the drawn-out legal battle, which in April 1984 was finally settled in the US Supreme Court in favour of Anspach and Anti-Monopoly, and later further in a private and secret agreement between Parker and Anspach. Anti-Monopoly could again be published in USA and was also licensed to several Western European countries. But, what had started as an attempt by Goliath to quash David grew to an affair of international proportions, at the end of which the Parker reps were forced to admit the deliberate deception.

Monopoly in the UK

In spring 1935, Parker Brothers sent a sample of Monopoly to Waddingtons in the UK. Norman Watson, head of the playing

The first patent for the landlord's game.

Monopoly quotes

'The joy of Monopoly is in that delightful thrill you get when wiping out a friend.'
(comedian Shelley Burman)

'There is enough skill present to congratulate yourself when you win, and enough luck present to blame the dice when you lose.'
(psychologist Dr Joyce Brothers)

card division, was given the sample and told to try it out over the weekend.

It got such an enthusiastic reception that on Monday morning Victor Watson, senior head of the company, placed a transatlantic telephone call - a rarity in those days, the first made by Waddingtons and also the first telephone call received by Parker Brothers from Europe.

Before putting the game into production, Waddingtons decided the game would fare better in the UK if the properties had street names from London rather than from Atlantic City. Victor Watson therefore gave his secretary the task of walking around London 'to get the right names'. The railroads also became railway stations, and the dollars got exchanged for pounds.

No Inflation

Inflation has never affected Monopoly in the USA or UK: all prices and rents have remained unchanged since 1935! Monopoly also has a lot of 'fan clubs', the best-known being one in Detroit which organises the annual Northwest Regional Invitational Tournament, the most prestigious after the US National Championship. A number of 'Monopoly World Records' have also been set, including largest gameboard (286x233 metres), smallest gameboard (25x25 millimetres), longest game in a lift (384 hours), in a tree (240 hours), under water (1,080 hours), while hanging upside down (36 hours) or just plain longest (1,416 hours).

The Street Names

Ever since the days of Darrow, the street names in the official American version have been from Atlantic City in New Jersey. In other countries they are usually streets and landmarks of that capital.

The most expensive property in the US edition, Boardwalk, is Mayfair in the UK, Rue de la Paix in France, Kalverstraat in the Netherlands, Arbat in Russia (where the ban was lifted during the perestroika), Schlossallee in Germany, Paradeplatz in Switzerland, Paseo del Prado in Spain, Norrmalmstorg in Sweden, Erottaja in Finland and so on. The Atlantic City street names were kept in the Japanese

edition, but the Arabic and Hong Kong Chinese versions use London. Several official 'local' editions are also published, such as a Bavarian one with Munich streets and a Catalan one with Barcelona names.

In the US, Monopoly is close to being a national institution. In September 1972, Atlantic City's commissioner of public works suggested to the city council that Baltic Avenue be changed to Fairmount Avenue and Mediterranean Avenue to Melrose. Both streets are on the US Monopoly board.

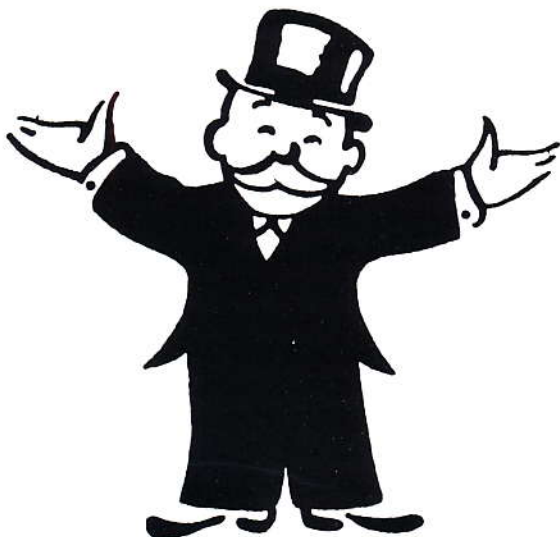
When the news reached Parker Brothers, the company President Edward Parker sent a tongue-in-cheek letter to the commissioner, warning that the proposed changes if instituted would have repercussions 'that could possibly shake the very foundations of American tradition'. That made the affair a lead item on the front pages and the TV news nationwide. Parker's offices were flooded with thousands of letters and telegrams stating their support. College students, never passing up on an opportunity to rally around the cause of 'the underdog' against the Establishment, hurriedly formed committees such as Princeton University's 'Students to Save Baltic and Mediterranean Avenues'.

The climax of the controversy occurred on January 11th 1973 at a public hearing in Atlantic City, which could easily have been mistaken for the site of a presidential news conference during a national emergency. Hordes of reporters, photographers and TV cameramen crowded the room, and the Vice President of Parker, Randolph Barton who had flown in for the occasion, addressed the commission with an eloquent plea ('these are not just Main Street or Elm Street in any city; they must be placed in that category in which belong such landmarks as Broadway and Champs Elysées...') When the vote was finally taken even the commissioner responsible for the proposal voted against it. Baltic and Mediterranean Avenues still exist in Atlantic City, and no doubt will never be tampered with again.

In Atlantic City a memorial bronze plaque at the corner of Boardwalk and Park Place, the two most expensive properties on the US gameboard, honours Charles Darrow, who despite the revelations is deeply connected with the game.

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Milburn Pennybags, the Monopoly millionaire, was created by the design department at Parker Brothers and now adorns the box cover and gameboard in most countries where Monopoly is sold.



ANIMAL INTELLIGENCE

Out for the Count

Can you Count on Animals Counting?

At the Brain Club University in Port Antonio, Jamaica, an article in the *Sunday Gleaner*, one of the island's leading newspapers, was brought to our attention. It concerned the ability of animals to count. The article quoted a number of cases, and made some interesting points.

Give a hungry pigeon a choice between two and three peas, the chances are it will go for the three. Likewise if you offer a greedy chimpanzee four bananas in one place and two in another, it will go to the place with four bananas. Clearly animals have a concept of size and amount. But can they count?

If a number of black spots are flashed on a screen, too short for anyone to count, a test human will begin to make errors from about six or seven spots onwards. This correlates almost identically with observations on dogs, parrots, pigeons and even bees. All these animals can apparently estimate the number of objects up to six or seven without having to count. So are they any different from us in their initial calculating ability?

Evidence that they can count is suggested by the fact that it is apparently easy to teach a parrot to take only as many pieces of food as it has heard a whistle being blown before. Budgies even learn to eat a fixed number of seeds, say two at the sound of a bell, and three at the sound of a buzzer. In 1974, a woodpecker in France mastered a pecking code in which one peck meant a pistachio nut, two a cricket, three a meal worm and four a cockchafer.

This bird apparently knew exactly what it wanted when it pecked the food code: if its owner responded to four pecks with a nut or a meal worm, it would throw them away and begin to peck four times anew until

it was given the cockchafer it had ordered!

Perhaps the ultimate so far reported has been achieved by Miss Seibt and her pigeons ten years ago. To obtain one piece of food, the pigeons learnt to peck at a target five times when three flashes of light were shown, or to peck twice when four flashes of light were shown, etc.

If *Use Your Head* readers have similar stories, you can count on us to publish them!

Thriving Dinosaurs

To label as 'dinosaurs' major corporations now coming to grief because of outmoded policies is an insult to the dinosaurs! So says Michael Schrage, the syndicated financial columnist. The huge lizards adapted intelligently to their environment, thrived for 150 million years - several hundred times as long as the 100,000 to 200,000 years *Homo Sapiens* has lasted so far - and were destroyed only by a meteorite 'the size of Disneyworld' which they could not do much about.

'The horrible lesson here,' writes Mr Schrage 'is that businesses and industries that now teeter on the brink of economic extinction are, in pure evolutionary terms, simply dumber than the dinosaurs.'



IT'S NOT ONLY A GAME

The awarding of the Nobel Prize in Economics to the American John Nash last month meant that, for the first time in the institution's 93-year history, the prize was awarded for work in pure mathematics. Keith Devlin on the maths pioneer whose work in 'game theory' netted a Nobel Prize.

When Swedish chemist, engineer and philanthropist Alfred Bernhard Nobel established the awards in 1901, he stipulated chemistry, physics, physiology and medicine, and literature, but did not create a prize for mathematics. It has been rumoured that a particularly bad experience in mathematics at high school led to this exclusion of the 'queen of sciences', or it may simply be that Nobel felt that mathematics was not, in of itself, of sufficient relevance to human development to warrant its own award^{*}. Whatever the reason, the mathematicians have had to make do with their own special prize, the Fields Medal, which differs significantly from the Nobel Prize in being restricted to mathematicians who are less than 40 years old.

The back door opened when the Swedish National Bank established the Nobel Prize in Economics in 1969. It was the application of Nash's work in economic theory that led to his Prize, shared with fellow American John Harsanyi and German Reinhard Selten. Nash's contribution to the combined work which won the award was in the mathematical subject known as game theory. Nash's key idea - now known as the Nash equilibrium - was developed in his PhD thesis, submitted to the Princeton University mathematics department in 1950, when Nash was just 22 years old. The thesis had taken him a mere two years to complete. He had received both his BS and MS degrees in an equally rapid three-year period, starting in 1945 and finishing in 1948, at the Carnegie Institute of Technology (now Carnegie-Mellon University). The thesis was entitled 'Non-cooperative Games'.

Game theory is the abstract study of games: draughts, chess, poker, and so forth. It becomes relevant to the more serious

aspects of life when its results are applied to warfare, political conflict, or economic competition. The game theorist examines the strategies the players in such a 'game' may adopt. A pure strategy in a game is a complete plan for every possible situation that the player might encounter during the course of play. When the pure strategies of all players are submitted to an umpire, the entire course of play and the pay-offs to the players are determined.

However, not all games can be solved with pure strategies, and players must then use a mix of pure strategies by choosing the probabilities with which each pure strategy is played. For example, in the game where two players simultaneously put down a penny, with one player winning if they both match (both heads or both tails) and the other winning otherwise, the purer strategies are 'heads' or 'tails' and the mixed strategies are the random frequencies with which a player chooses to play these pure strategies.

In his thesis, Nash proved that in any game there exists at least one set of mixed strategies, with one for each player - a so-called Nash equilibrium point - such that no player can improve his or her position by changing strategy. At a Nash equilibrium point no one can improve his or her position, and adoption of those mixed strategies results in a stable situation.

Nash used methods from topology to prove the existence of an equilibrium point. His result applies to any finite, non-cooperative game involving any number of players. (The word 'finite' here refers to the fact that the number of possible strategies are limited; 'non-cooperative' means that players may neither communicate nor form alliances.)

** I have read elsewhere (although I am not certain of the veracity of the report) that the reason for Nobel's disdainful view of mathematics was that his wife left for him a mathematician. When compiling his list of subjects for the award of prizes, he saw an opportunity to extract revenge against the mathematical community in general (editor's note).*

Game theory began to be applied in economics following the publication of the book *Theory Of Games And Economic Behaviour* by John von Neumann and Oskar Morgenstern in 1944. Their analysis was largely limited to games involving only two players, but Nash's proof of the existence of at least one equilibrium point in the much wider class of non-cooperative games with any number of players has had a major impact on modern economic theory.

If you think of economic behaviour as a game in which there are well-defined rules, and all the players try to maximise their pay-offs, then in general it will be possible for any given player to improve his or her position by changing strategy. Consequently, players will keep changing their strategies until they reach a Nash equilibrium point at which no player can improve his or her position. In some cases, this analysis makes it possible to predict the likely strategies that economic actors will adopt in the long run - namely, those at a Nash equilibrium point at which no player can improve his or her outcome.

An illustration of Nash's notion of an equilibrium point that has a perplexing twist in its tail is provided by the Prisoners' Dilemma. This was devised by Nash's advisor at Princeton, Albert Tucker, a topologist turned game theorist. Tucker created the paradox in 1950, the same year Nash wrote his thesis.

The Prisoners' Dilemma asks us to imagine a scenario where two suspects are

caught by the police, and, during the course of separate interrogations, are offered the following choice. If one confesses and the other does not, the confessor goes free and the other gets a long jail sentence; if neither confesses, each goes to jail for a short time; if both confess, each receives an intermediate jail sentence. Each reasons that he is better off confessing because if the other confesses, he receives an intermediate sentence by confessing and a long sentence by not confessing; if the other does not confess, he goes free by confessing and receives a short sentence by not confessing. Since each reasons this way, each confesses, and so each is given an intermediate sentence.

The strategy whereby both confess is the Nash equilibrium in the game because neither can improve his position by changing his strategy (because to renege on confessing means jail for a long time). What seems paradoxical about this situation is that, if both suspects continue to protest their innocence, they would both receive a short sentence, yet common sense logic compels them both to confess and end up spending longer behind bars.

At least they will be able to console themselves with the knowledge that their time in jail is consistent with the first mathematical theorem to win a Nobel Prize.

© *The Guardian* 1994. Keith Devlin is a professional mathematician living in California. His latest book, *Mathematics: The Science of Patterns*, was published by W H Freeman on October 27.



POETRY CORNER

THE SKELETON KEY TO THRICE THIRTEEN MYSTERIES

Shakespeare found fame with Venus And Adonis.
His first high bid to catch the world's attention.
He called it: 'the first heir of my invention.'
His later plays drew little or no mention
For all preferred his Venus And Adonis.

What is this tale of Venus And Adonis?
The love-song of the Love Goddess—a Venus
Melting down with lust for cold Adonis.
Adonis cold? What frost had chilled Adonis?
Dread of the naked appetite of Venus.

Could mortal man repulse immortal Venus?
Yes and no. Right here began the drama.
'Let go and let me go!' – so cried Adonis.
'Go, get thee to a nunnery, like Ophelia.
Drown in the Dardenelles, like Desdemona.
Or curl up into zero, with Cordelia.
Or climb into your tomb, with Cleopatra.
Be buried under flowers, with Imogen.
Drop, with Hermione, under the judge's hammer.
Be mummified with Sycorax. When O when
Will some brave tempest puff away all this magic.
Spilt milk, tears, broken eggs, it's all too tragic.
Give me the wild boar and my boar-hound's clamour!
So, with a critic's rigour, spoke Adonis.

Did Venus drop this wilful boy Adonis?
No, she obeyed. His will became Shakespeare,
Who wrote their story: Venus And Adonis.
So from that hour, Venus obeyed Adonis:
Became Ophelia, drowning in a tear;
Then Desdemona, whose charmed handkerchief
Stifled her while she sobbed. Cordelia, hung
In twisted strings of her rejected heart.
And all the rest. Venus played every part
Where that condemned and doting heroine clung
To the pitiless hero's hand that pushed her off
And took her life. And these are what we knew
As The Complete Works. This Venus And Adonis
Is the mosaic mystery on the floor
Of Shakespeare's crypt: the boar-hound and the boar.
The Goddess mourning over slain Adonis
Watching, out of his blood, the flower grow
That she will carry to heaven between her breasts,
Attended by the doe, the fawn, the hare
The stallion and the mare.

TED HUGHES
Poet Laureate

This poem, deliberately constructed by Poet Laureate Ted Hughes to be difficult to remember, was used for the Poetry competition at this year's World Memory Championships. The winner of the event was Natacia Diot, who correctly recalled 149 words in 15 minutes.

AMAZING MEMORY STORIES

Record Breakers

Did the report on the World Memory Championships in the last issue of *Use Your Head* whet your appetite to become a world-record holder? Do you fancy taking on Jonathan Hancock and Dominic O'Brien in the World Memory Championships? If so, here are some of the targets you should be looking to reach.

Speed Card Memorisation

A single deck of cards is thoroughly shuffled, then memorised as quickly as possible. The cards are looked at once, in sequence, with no back-tracking allowed. No errors of recall are permitted.

Until recently the world record was held by Tariq Mamoon, who achieved a time of 44.62 in August 1993 in Florida, USA. However, this record was broken by the then reigning World Memory Champion Dominic O'Brien in March 1994 who clocked an amazing 43.69 seconds. Current World Champion Jonathan Hancock is the only other person to clock under one minute.

One Hour Card Memorisation

This record was inaugurated in 1991 when Jonathan Hancock recorded four complete packs in one hour with only six errors. Hancock then beat his own record at the 1993 Memoriad, memorising six packs perfectly, but his new mark stood for only three minutes as Dominic O'Brien achieved perfect recall of eight packs. O'Brien in turn then beat his own record at the 1994 World Memory Championship with a score of nine and a half packs (O'Brien actually memorised ten packs, but misremembered one card, thus losing half a pack).

Try to memorise a pack yourself (you might prefer to start with half a pack). With a little practice you should be able to reach the following benchmarks.

26 cards in 30 minutes: An average score.

52 cards in 30 minutes: You have a good memory.

52 cards in 15 minutes: You can out-memorise 98% of the population.

52 cards in 6 minutes: You are good enough to compete in national championships.

52 cards in 3 minutes: You are good enough to compete in the next World Championship.

52 cards in 60 seconds: You are one of the top four in the world.

52 cards in 50 seconds: Try to speed up a little - you might break the world record!

Speed Memorisation of Random Numbers

The record for memorising random digits within 15 minutes was set by Dominic O'Brien in October 1991 at the first World Memory Championships, where he achieved 266 digits perfectly memorised. At the 1994 Memoriad a record of 1,080 digits in 60 minutes was set by (yes, you've guessed it!) O'Brien again.

Memorisation of Pi

The memorisation of *pi* is one of the oldest memory tests, and for a long time the record was held by Professor A.C. Aitken of Edinburgh University, who could easily remember the first 1,000 places. However, in 1980 Creighton Carvello recorded an astonishing 20,013 decimal places and in so doing inspired a host of young memory experts, including Dominic O'Brien and Jonathan Hancock. Remarkably, Carvello's record has since been broken twice, first by a young Indian, Rajan Mahadevan with a score of 31,811 decimal places and latterly by Hideaki Tomoyori from Japan who recorded a staggering even 40,000 places in 1987 to become the reigning world record holder.

It's Your Turn

A full list of mental world records is given in the *Book of Genius*.

To register your world record, you need to ensure your record is properly verified and send a note of the record with proper authentication of at least two witnesses to: Mental World Records, c/o Tony Buzan, The Harleyford Manor Estate, Marlow, Bucks SL7 2DX. Please enclose a cheque for £10 made payable to 'The Brain Trust' to cover the cost of registration.

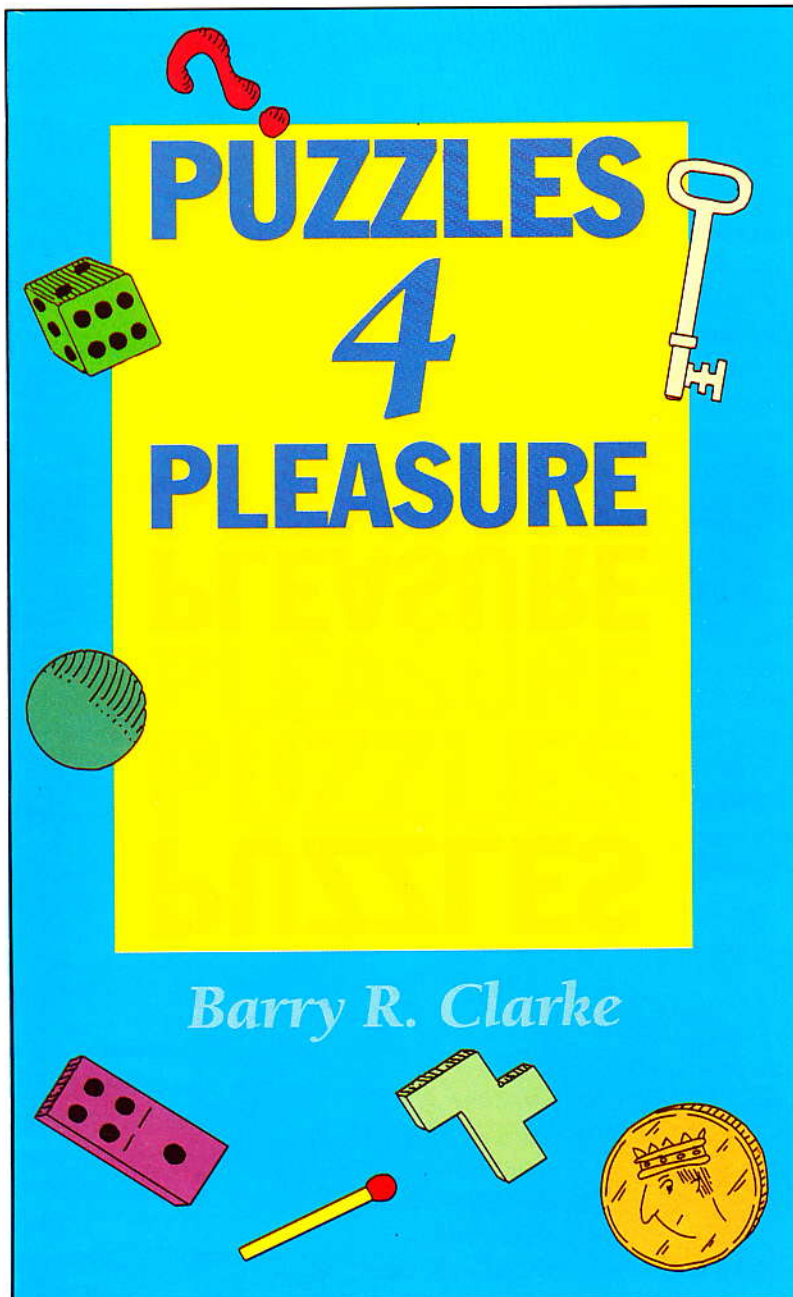
CHRISTMAS REVIEWS

Reviews by Andrew Kinsman and Byron Jacobs.

Puzzles for Pleasure

Barry R. Clarke

In this delightful collection of brain-teasers, Barry Clarke offers something for everyone. Every puzzle is accompanied by an amusing cartoon and there is also a brief history of recreational mathematics. Here is a short example to whet your appetite (answer on page 23).



Barry R. Clarke

Railway Rhyme

Platform I we departed at nine,
'Au Revoir!' to Beaujolais wine,
Reminisces to toast,
In our train to the coast,
State the place at the start of the line.

An ideal stocking-filler!
(Cambridge University Press, paperback,
£6.95, ISBN 0-521-46634-2)

Understanding Toscanini

Joseph Horowitz

The scope of this book far exceeds that of a standard biography. The life of the great Italian conductor Arturo Toscanini (who was featured in *Use Your Head* magazine, Spring 1994, pp24-25) is merely used by former *New York Times* music critic Joseph Horowitz as a starting point for a perceptive and original study of musical culture in America in the twentieth century.

(Faber, paperback, £15.00,
ISBN 0-571-17147-8)

The Runaway Brain

Christopher Wills

The Runaway Brain is not light reading. Even the most proficient speed reader would struggle to get through its 311 pages whilst taking a bath. Nevertheless, anyone interested in the brain and its workings will find much of interest here. Wills has brought genetic insights to the problem of placing the brain in an evolutionary context and the result is a remarkable combination of ideas. The basic theme of *The Runaway Brain* is that the brain is like a peacock's tail, in that they can both be viewed as a success. Nature likes a success and as soon as it starts one, it becomes impossible to stop.

This thesis, expounded at length, is interwoven with the tales of many of the key players who figured in the development of critical pieces of the evolutionary jigsaw. The result is a fascinating synthesis and an excellent read.

(HarperCollins, paperback,
ISBN 0-002-55275-2)

Remarkable Discoveries!

Frank Ashall

In this magical mystery tour of major scientific discoveries, Dr Frank Ashall shows us how scientists have made the discoveries that have pushed back the frontiers of knowledge and have changed the way we look at the world. Ashall takes the reader into the world of the researcher and enables us to experience the excitement as each discovery is unfolded. He believes that in fact most discoveries are made by accident or from the curiosity of scientists who are interested in learning more about the laws of Nature. Ashall's canvas includes the discoveries of electricity, X-rays, penicillin, DNA fingerprinting, the Big Bang and much more. A highly-accessible book for anyone curious about scientists and their inventions.

(Cambridge University Press, hardback, £16.95, ISBN 0-521-43317-7)

The Microsoft Office Pack

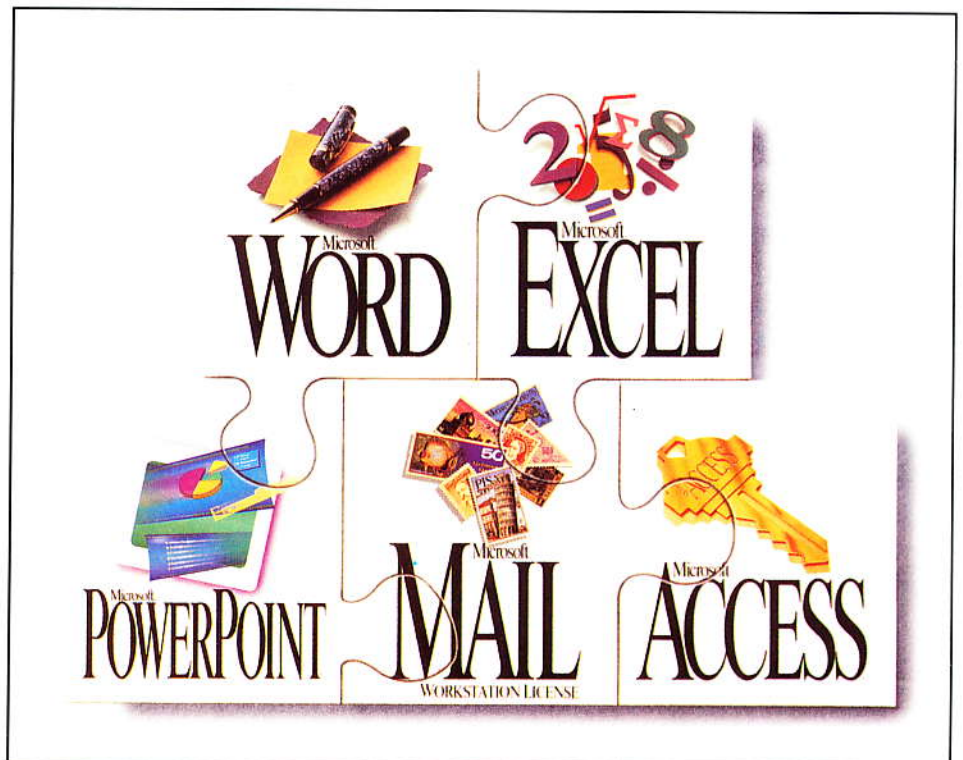
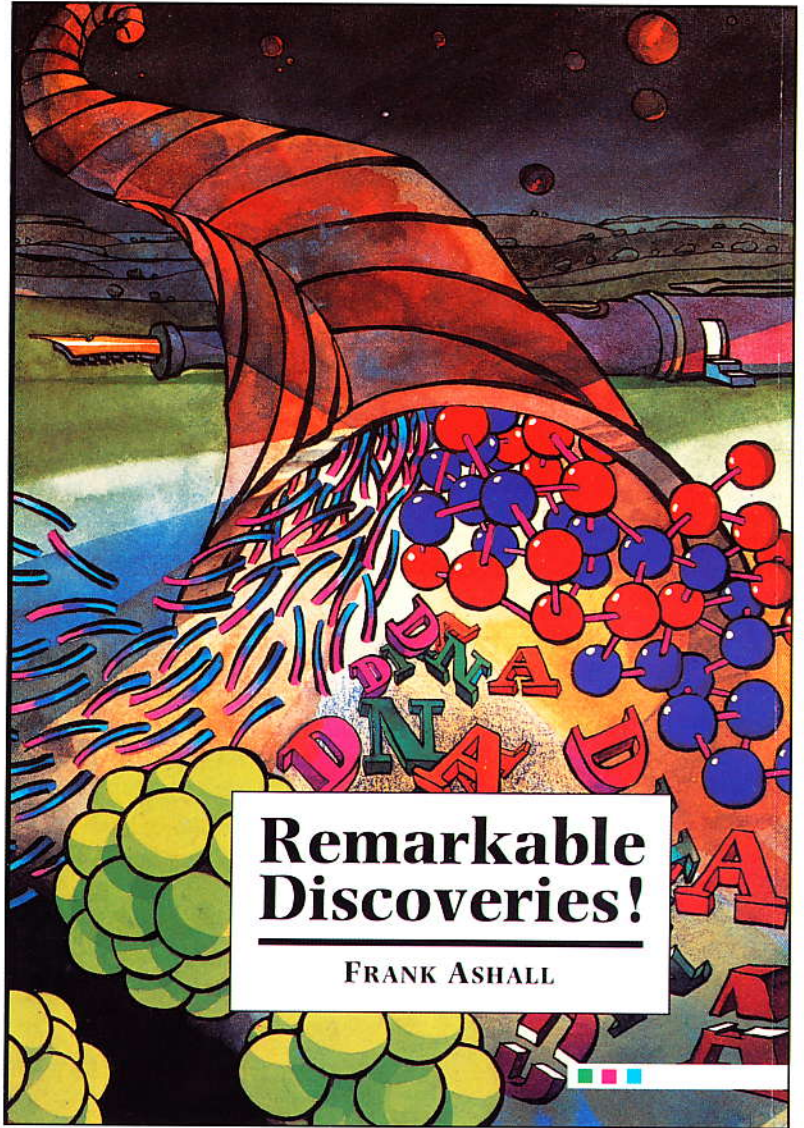
Microsoft Corporation

This pack, which was kindly supplied by Microsoft to assist with the production of *Use Your Head* magazine, puts me in mind of an old Indian proverb relating to chess: 'Chess is a sea in which a gnat can drink and an elephant can bathe.' The Office pack, which comprise a word processor (Word 6.0), a spreadsheet (Excel 5.0), a presentation graphics system (Powerpoint 4.0) as well as a sophisticated programming language, is sufficiently complex and feature-laden to keep any water-bound elephant happy. However, at the same time and despite coming with manuals running to over 1,000 pages, it manages to make itself user-friendly for the novice computer-user. It achieves this with a combination of on-screen tutorials, cue cards, permanent on-line help and an intuitive and easy-to-use interface.

No wonder Bill Gates is America's youngest billionaire and Microsoft are the world's leading computer software company!

Solution to Railway Rhyme

Hopefully, you all got it: PARIS, as spelt out by the letter at the start of each line.



CHRISTMAS PUZZLES

James Longworth's Festive Feast of Fun

It's here at last. Yes, Christmas is upon us once more. That is not to say that it has not been upon us for the last three months while the retail outlets cash in on our festive generosity, but in real terms the Yuletide, Christmas, Nativity, and Advent period has arrived... The time of year that suggests family reunions, unwanted Noddy books from Great Auntie Jessica, and those figs that someone found at the back of the larder, which I do not recommend you touch, let alone eat. Perhaps more importantly, though, us students find ourselves striving hard to knock off that millisecond from our pack of cards memorisation time. For, not only do we have to hurdle Christmas Day, Boxing Day, New Year's Eve, and those parties both before and after 25th December, but we also have to get through the Student World Memory Championship. As you down that glass of mulled wine on 16th December, think of us, and think also of the puzzles that I have dug up for this edition of *Use Your Head*.

This edition's mental challenges have a festive air about them, that is not to say that they smell of anything, but that they are designed to get you into the swing of things. For the minority of readers who

will be taking part in the Student Memoriad, take time out of training to crack the uncrackable, and for those of you that are not competing, put on your metaphorical (good Scrabble word) thinking cap and leap into the unknown.

After the success of the Smith, Jones, Robinson puzzle that I left you with in the last edition, I thought that I would indulge in another. I have modified the following classic into a festive form.

There are three prospective Father Christmas lookalikes who have replied to Santa's ad for a helper in the *Toytown Times*. Father Christmas is a very wise, and considerate man, and decides to make the cleverest, most intelligent of the three his helper. He

therefore devises a test to discover the most brilliant of the applicants. He draws up five stickers. Three of these have a picture of a mince pie on them, and the other two a picture of a Christmas pudding. He summons the three applicants into his study, and blindfolds them. He then places one sticker on the forehead of each applicant, without them seeing which design is being put on them. There are therefore two stickers left on the wall in Santa's study. He then leads the three hopefuls into another room and locks the door. He orders them to take off their blindfolds, and explains that the first person to announce what shape he has on his head will become his chief assistant. The applicants can neither see the remaining two stickers in Santa's office, nor the sticker on their own heads. They can, however, see the sticker on the other two applicants' heads.

You are one of the applicants for the job. No other applicant has announced the answer after a few minutes. What picture do you have on your head and why? There are two perfectly legitimate ways of getting the right answer. Can you work one of them out to become Father Christmas's helper this Christmas, before reading on?

Well, now that you are reading this, you have either gone mad, and given up, not bothered to try the puzzle at all, or have worked out an answer. Whether legitimate or not is a different matter. I have to confess that I did not get the answer right originally. The two actual explanations for the answer are, in fact, a lot closer to home. The answer is that you would have a picture of a mince pie on your head. There are two possible explanations for this.

First, I mentioned earlier that Santa was a considerate and fair man. He would therefore have given you a fair test of intelligence, and would not have been biased towards any one of the applicants. He must therefore have given you and all of the applicants a mince pie sticker, as there are three of you, and only two Christmas pudding stickers.

The second, more logical, explanation is as follows: let us refer to the other two par-



ticipants as 'A' and 'B', and view the situation from A's point of view. A can see one pie (on B's head) and one other sticker (yours). If your sticker is a pudding, then this means that A is seeing one pudding and one pie. If this is the case, then A should fairly quickly reason that his own sticker cannot be a pudding because, if that were the case, then B would see two puddings and immediately deduce that he must have a pie on his sticker (there being no puddings left). The same logic also applies if you view the situation from B's point of view. Therefore if, after a short while, neither of the other applicants has declared, your sticker cannot be a pudding, and you can confi-

dently declare that you have a pie.

To ensure that your insatiable thirst for mental stimulation is kept happy, I thought that I would end my article by giving you a crossword. This is no ordinary crossword, though. This is a *Use Your Head Club* Double Twist In The Tale Type Of A Crossword. The answers are all people, events, phrases, words, or places that are associated with the *Use Your Head Club*.

If you would like to suggest ideas for puzzles or features, I can be contacted at: Waynflete, Eton College, Berkshire SL4 6EY or Tel: (0753) 867775. Have a very special Christmas and enjoy the crossword.

Answers on page 35.

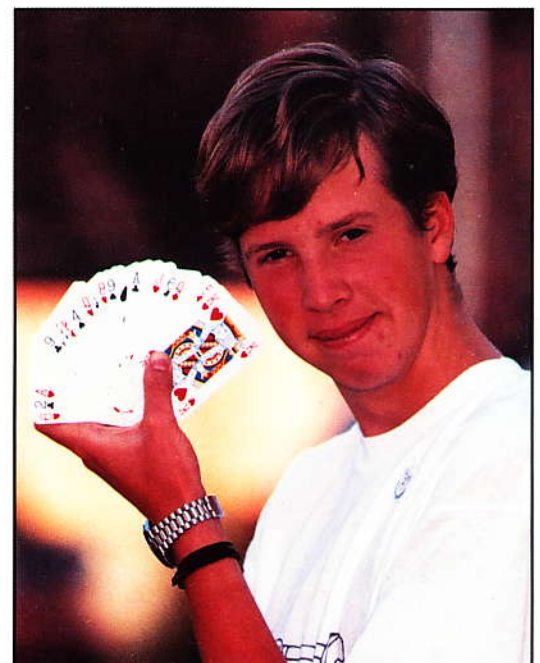
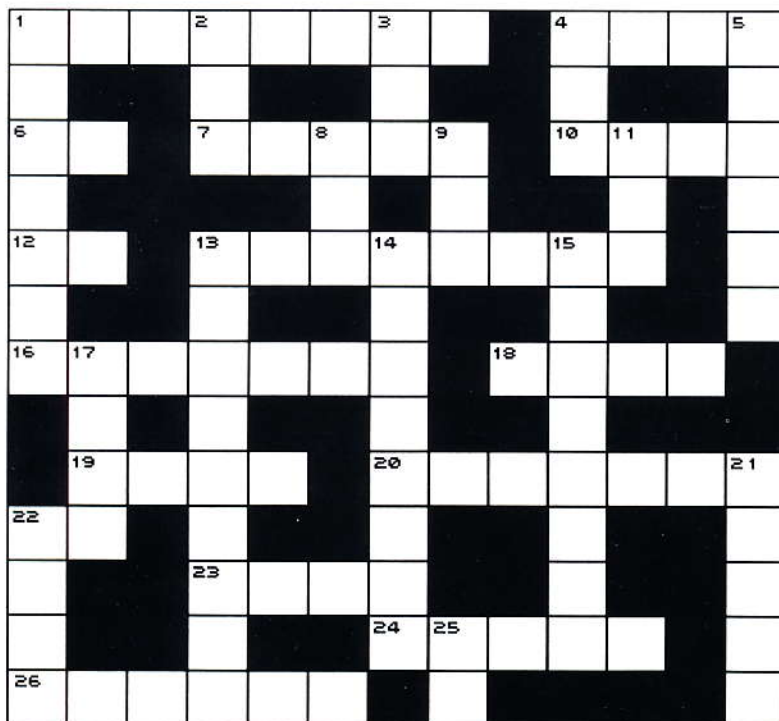


ACROSS

- 1 A gathering of mnemonists (8)
- 4 Think with this (4)
- 6 Short for electron microscope (2)
- 7 Is intelligence stored here? (5)
- 10 A real desire to do something (4)
- 12 Alright! (2)
- 13 Not as good as Jonathan or Dominic but better than the rest! (8)
- 16 Gap in a neurone (7)
- 18 Don't forget to use this at Christmas! (4)
- 19 Area in brain or ear (4)
- 20 Champion! (7)
- 22 ME is mental exercise - what is the athletic equivalent? (2)
- 23 Thoughts travel along here at 250 metres per second! (4)
- 24 Tony Buzan's favourite animal! (5)
- 26 All brains should play on this in the snow! (5)

DOWN

- 1 SEM³ fans are called this (7)
- 2 Travel with these sponsors (3)
- 3 Your brain improves with this (3)
- 4 You need this to get around your brain efficiently (3)
- 5 Binary or base ten these need to be remembered! (6)
- 8 Trade union, or feeling of brain in the morning! (3)
- 9 Help needed now! (3)
- 11 Mnemonists remember and are these! (3)
- 13 This lady likes teddies and Mind Maps (see last edition of UYH) (9)
- 14 This will never forget (8)
- 15 Your brain needs lots of this (8)
- 17 This time of year (4)
- 21 Enthusiastic about chess? (5)
- 22 Hang up memories with these (4)
- 25 Measure of intelligence (2)



James Longworth exchanges word play for card play.

BRAIN OF THE YEAR 1995

Last year the joint winners were **Dominic O'Brien** and **Lana Israel**. Who will be the 1995 Brain of the Year? We preview the leading contenders.

David Attenborough

David Attenborough is noted for his outstanding services to animal and planetary intelligence. His wildlife series for the BBC have become some of the most fascinating and popular programmes ever made.

Francis Crick

Having originally been responsible for the cracking of the DNA code, Crick has now moved on to become one of the leading lights of general brain research. This polymathic approach is typical of the great thinkers.

Dr Marion Tinsley

Dr Tinsley has been draughts World Champion for 45 years and is arguably the most dominant World Champion in any activity. During his reign he has suffered the unbelievably small total of only seven defeats. In recent years he has both beaten and held to a draw the computer program Chinook - a program capable of calculating 12 million moves per second and having a database of over 100 billion positions.

Anatoly Karpov

Karpov was World Chess Champion between 1975 and 1985. Although he has had to be content with the status of world number two since being defeated by Garry Kasparov in 1985, he has consistently performed brilliantly in tournament play and has managed to sustain the number two position in the face of great strides by the younger generation. Furthermore, following the split in the chess world, he regained the FIDE World Championship title, by defeating Jan Timman of the Netherlands. Earlier this year, Karpov crowned a superb tournament record by scoring 11/13 in the extraordinarily strong Linares super-tournament. This gave him a

tournament performance rating of 2945 - the highest rating ever recorded in an individual event. In comparison, the highest individual rating (calculated over a series of tournaments) is 2815.

Bill Gates

Bill Gates is the founder and chairman of the Microsoft company which designs the software that runs on the great majority of the world's personal computers. At the age of 36 his business success has made him America's youngest billionaire. Gates' motto is 'I can do anything I put my mind to' and he is well known for encouraging greater intelligence and cultural awareness within his company. He is also noted for a prodigious memory, astounding energy and stamina.

Michael Gelb

Michael Gelb is a black belt and teacher at Aikido as well as being the author of four best-sellers on the body, the brain and thinking. Gelb is a master juggler as well as being a TV brain star and top mental coach to Chief Executive Officers.

Steven Spielberg

Spielberg is the most successful film producer of the last ten years and is noted for his creativity and originality. He is also renowned for his intellectual ability and indefatigability.

Judith Polgar

This Hungarian teenage chess prodigy has become the first woman to enter the world's top twenty chess players. Earlier this year she scored a notable success in Buenos Aires, finishing with a 50% score in a world-class field that only lacked the world champion Kasparov from amongst the top players. She has been selected to

play on top board for the strong Hungarian team competing in the 1994 Moscow Chess Olympiad.

John Major

Despite daily predictions of his imminent demise, Britain's Prime Minister has become one of the longest serving in British history. On a global scale, he has outlasted approximately 80 Presidents, Prime Ministers and official Heads of State.

David Hindley

David Hindley is noted for his groundbreaking research into animal and bird intelligence. He is the first investigator to discover that the skylark sings the equivalent of 28 symphonies a day. He is also known for his brilliant and original teaching of music as well as his charity work.

Jonathan Hancock

The new World Memory Champion produced an astonishing performance in the final event of this year's Memoriad. At the start of the event he was marginally ahead of the reigning champion, Dominic O'Brien, but card memorisation (the final event) is Dominic's forte. If Hancock was beaten here, he would have been overtaken in the overall standings. His response to the pressure was fantastic - he beat Dominic, the card memorisation king, by 27 seconds.

Philip Bond

Philip Bond, a top arbitrage expert and trader established a new world record for the matrix memorisation of π (10,000 places). Bond has three degrees, in business, economics and mathematics and is also a multi-linguist. Being an adherent of healthy body, healthy mind, Bond is a keen sportsman and has been inter-university power-lifting champion.

Muhammad Ali

Muhammad Ali, the former heavy-weight boxing world champion, has the most recognised face in the history of the world. Despite suffering from progressive Parkinson's Disease, he has maintained an exceptionally active schedule for promoting reading schemes and literary

projects while seeking to emphasise the intelligence of the athlete. He is still considered by many other champions, to be the greatest athlete of the twentieth century.

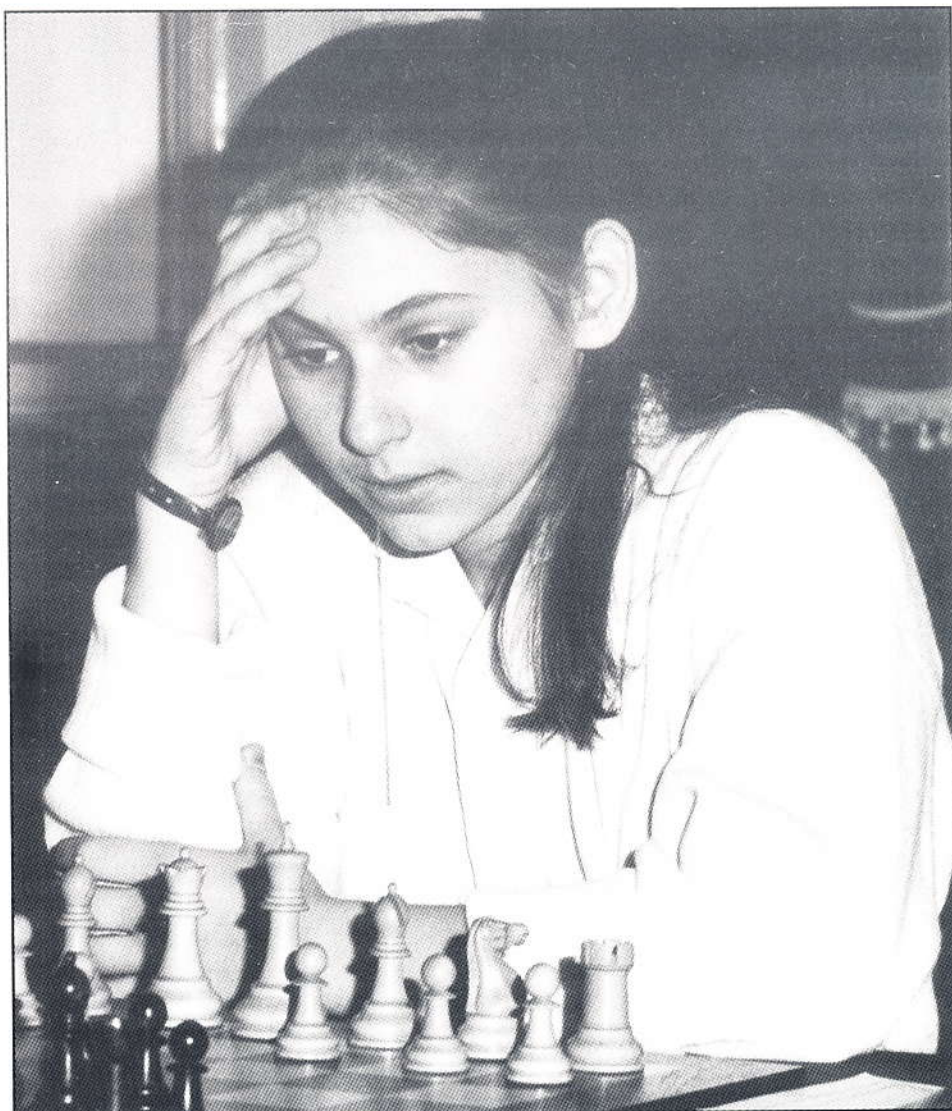
Nelson Mandela

Nelson Mandela has masterfully handled the transition of power in South Africa. In this, he has demonstrated exceptional stamina and determination. He is dedicated to education and learning as a means of bringing about change.

Sarah Chang

Thirteen-year-old Sarah Chang is taking the classical music world by storm. She has already received the awards of Gramophone Young Artist of the Year 1993 and Classical Music Awards Newcomer of the Year 1994. This gifted Korean-American violinist has been described by Yehudi Menuhin as 'the most wonderful, perfect, ideal violinist I have ever heard.'

Judith Polgar



Anatoly Karpov



Sarah Chang



Jonathan Hancock

INTELLIGENCE ABOUT INTELLIGENCE

Twelve Fascinating Facts about the Brain

The left brain, the centre of logical thought, controls the right hand and vice versa. Since the right brain is stronger in visual skills, it is perhaps hardly surprising that left-handedness is roughly twice as common among artists.

Through your olfactory system (your nose!) your brain is able to detect one molecule of 'smell' in one part per trillion of air.

Your brain is the only living part of the body that cannot feel pain.

Within your brain there is enough atomic energy to build any of the world's cities many times.

Your brain listens with your ears. These both contain 24,000 fibres that are able to detect enormous ranges and subtle distinctions in the air's molecular vibrations.

The brain is about the size of two clenched fists and, on average, weighs an incredibly light 3 lb (1.4 kg).

The number of neurons or nerve cells in your brain is approximately 12 trillion (more than two and a half times the number of people currently living on the planet).

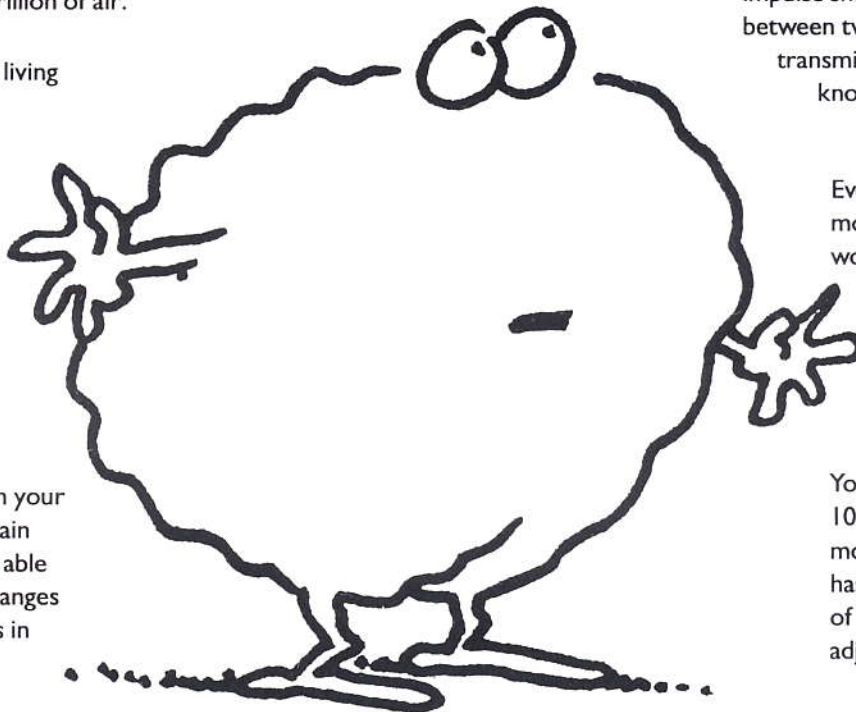
The function between brain cells where communication crosses is called the synapse. In the synapse, an electrical impulse shunts chemical messengers between two brain cells, transmitting thought. No one knows how this is done.

Every day your brain makes more connections than the world's telephone system.

The brain consumes 20 per cent of the body's oxygen system.

Your brain cells contain 1000 trillion trillion protein molecules. Each brain cell has the physical possibility of connecting with 100,000 adjoining brain cells.

Your body provides your brain with information through a network of 500,000 touch detectors; and four million pair sensitive structures.



READING IN THE FAST LANE

Freya Crofton, 10 years old, astonished Radiator Thinking Instructor Lynn Collins when she gave a speed reading talk at Lynn's son Michael's school, Wellesley Park Primary, in Wellington, Somerset last spring. Freya began at 1500 words per minute, and in the course of a 45 minute talk advanced to over 4000 wpm, beating the current world speed reading record! A subsequent private session with her confirmed those speeds, and she impressed Tony Buzan and Vanda North in July, reaching an astonishing 9,230 words per minute! Testing by Tony revealed that her comprehension needs improvement; nevertheless he and Vanda were very impressed by Freya's remarkable accomplishment. Lynn sat down with Freya

and her mother Maureen, who teaches at the school, to find out how a primary school child can reach such reading speeds.

L You were born in Somerset, in Taunton?

F Right, on 4th June, 1983.

L When did you learn to read, and how?

M She was three years old when she learned to read. She would prefer books to any toys that were offered. I taught her in response to her constant questions. She wanted to know what was on all the food labels when we went shopping, what the signs at the multi-story car park said, and so

forth. So I put labels on objects at home, and gave her a matching set of cards. She had to show me the correct one if she wanted something. It was her curiosity that made her want to read.

L What other activities do you have?

F I am in Drama club at school, I sing in the choirs at school and in church, I play piano and trumpet (I just passed my Grade 3), and I am also in the Guides.

L Any sports?

F Yes, I play netball, football and cricket at





school, and I ride.

L What are your favourite subjects in school?

F Maths and English. Maths comes first. I used to be hopeless at maths, but I'm not any more.

L How did you get that turned around?

F At the beginning of this year I was doing maths in the second group, and it was easy, so I just kept on doing harder and harder things.

M And then it became a point of honour to be better than the boys?

F Yes, because they go on about how they're the best at everything.

L But why do you think it suddenly became easy for you?

M I actually suspect a year of superb teaching by a maths teacher who gave her great confidence, the belief that she could, which is what she lacked. That would be my feeling. I don't know if Freya would agree.

F I think I would.

L Any other interests?

F I play chess as well. As for reading, there are still books after school; I read a lot out of school. I mean, out of school three books a day would probably be normal. I read when I wake up in the morning, I read when I go to bed; if I've got library books I read at meals as well.

M We have rows about that.

L Does this affect your social life?

M Yes, it does. I get very grumpy; I am forbidden from reading at meals.

F Well, I only read when you're already reading the paper.

L I can't think where she picked it up. What are your goals in the short term?

F I want to be in the top group at Wellington (School) and to get good grades.

L Do you have some long range goals?

F I would like to try to get to university ... probably more grades on my trumpet and piano ... and something with my singing, too ... and to get better at speed reading ... and more comprehension. I'd like to get at least

85% comprehension.

M She's a perfectly normal child!

L Do your friends know about the reading?

F Well, most of them could have guessed there was something to do with my reading, because they keep going 'How come you can read five books per silent reading period of half an hour, and I can read about 20 pages?'

L What do you tell them?

F That I just read fast! Because I find that I probably understand more of it at a certain speed than ... because when I go faster and yet again my comprehension level is still slightly behind, but if I read slightly slower but not as slow as I normally would I sort of relax more, therefore I understand more of it.

L Do you think your friends would like to read as fast as you, or faster than they are now?

F Well, most of my friends for some reason have this weird theory: Reading is boring.

L What do you think about reading?

F Well, I think anyone who believes that must be out of their mind.

L Do you read any non-fiction?

F Yes, I like history.

M Travel books!

L Escapism! What is your reaction to all this? What are you going to do with this 9,000 words a minute?

F Try to improve it! Try to get the comprehension up.

L So you've been reading for eight years.

M Yes. We had one frustrating year, when we came across a teacher who said 'You cannot read that fast.'

F So I had to read a book about twelve times before I was allowed to change it. In fact I read it once, and then sort of pretended I was reading it!

M I strongly suspect that was what hit her confidence later on. That is why she took a long time to adjust to maths and everything else. I think she had the ground kicked out from under her feet. I was peeved. Freya was upset with the idea of going to school, and I'd never ever had that from her before.

F So I slowed down...

L (Since you have been in a different school) Have you felt that you need to slow down now? In maths?

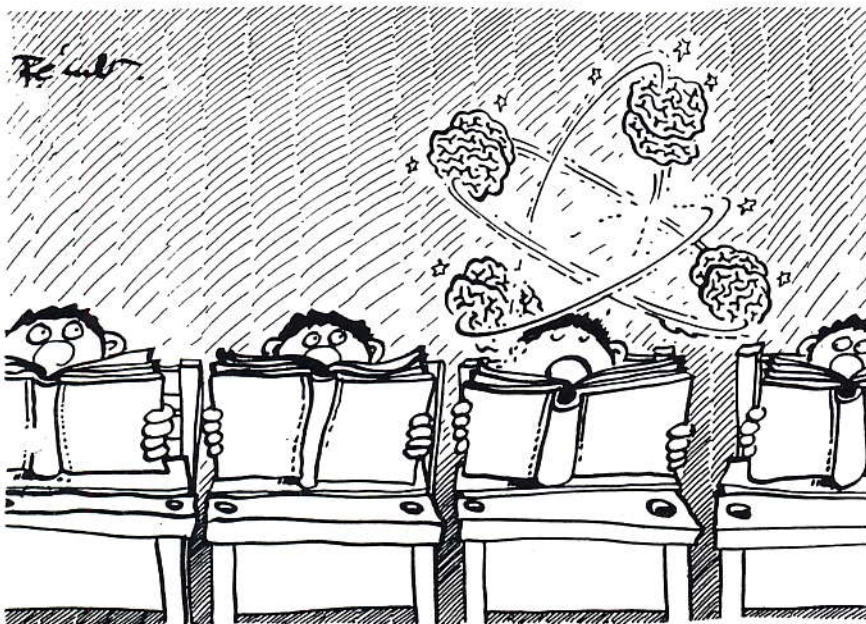
F No!

M Have you told Lynn that comment the boys made?

F These boys had been used to being the best at maths all the time they had been in the school. Now, I had been ahead of them in maths for about six months, and I overheard this conversation which went, 'At least there are no girls ahead of us in maths!' And the other one said, 'There's Freya,' and the first one came up and said, 'No, that's not a girl, that's just Freya!'

L Well, yes, that is Freya, and not a bad one to be! Would you like to help other people learn to read that fast? How would you do that?

F Yes, the same way you've been teaching me, using the guide, and noticing the backskipping. Most of my friends don't read solidly, they stop, do something else, and then they start again. I think most people, knowing somebody could do that, would certainly assume they would be totally boring, that would be all they were interested in. But it's possible to do that without being boring!



USE YOUR HEAD CLUB NEWS

Headboard

Ben Zander at the Barbican

On Wednesday 11 January, Benjamin Zander will be giving a lecture on, and then conducting, Mahler's sixth Symphony (see page 34 for full details).

Ben Zander was born in England and studied at Juillard School, playing the cello and composing. He has since become one of world's foremost teachers of music from the classic symphonic and historical point of view. He is Conductor of the Boston Philharmonic, a Professor of Music and his life's vision is to 'Musicate the World'.

Ben believes everybody is fundamentally very musical and that all that is needed to draw out this talent is the right teaching. He wants the whole world to sing and compose. He has become increasingly famous as an international lecturer and has often moved his audiences to ecstatic joy, and tears. At one of his lectures, after a one and a half hour demonstration of the meaning of music, an attending international businessman was so mesmerised that he got up and walked straight into a wall instead of the door. On another occasion, an aerobics instructor was sitting, watching a private rehearsal. At the conclusion, she had become so exhausted from excitement that she was unable to get out of her seat.

Ben Zander's new recording of Mahler's sixth Symphony is already being acclaimed as revolutionary. It is the first time musical instruments have been able to duplicate the hammerblow of a god. The forthcoming concert at the Barbican will be a Brain Club function. Please support this event by encouraging all members to attend.

Watch out for an interview with Ben Zander in a future issue.

Festival of the Mind

As reported in the last issue, a Festival of the Mind, an all day event, with important lectures from world's authorities on the brain, mind sports demonstrations and displays, is planned for 21 April at the Albert Hall.

This major event will mark the following anniversaries and celebrations: the 21st an-

ni-versary of the publica-tion of *Use Your Head* and the TV pro-grammes; the 21st anni-versary of the official launching of Mind Maps; the BBC will also be celebrat-ing with three new collectors editions of *The Mind Map Book*, *Use Your Head* and *Use Your Memory*; the launch of *Lessons from the Art of Juggling* by Michael J. Gelb and Tony Buzan; and the launch of *Buzan's Book of Genius* in paperback.

Much of the activity in the hall will be dedi-cated to genius. The festival will also mark the official launch of the *Use Your Head Clubs* and *Use Your Head* network in universities and schools. This will be a major fund-raising event for the Brain Trust charity and all ideas for this are welcome.

The festival will also witness the announce-ment of the winner of the Brain of the Year award for 1995 and a special black tie dinner at the Albert Hall will be held to celebrate this. Finally, there will be a lecture and concert with Ben Zander in the evening.



Ben Zander wants to 'musicate the world'.



Benjamin Zander has gained a reputation over the past twenty years in America as one of the leading Mahler conductors of the day. With this concert, Mr Zander makes his debut in his native England, conducting The Philharmonia, one of the world's great Mahler orchestras. This concert marks the release of Zander's recording of Mahler's sixth symphony with the Boston Philharmonic on the IMP Masters label (DMCD 93).

Tickets:

£25.00, £20.00, £15.00, £10.00, £5.00

BOOKING INFORMATION

TELEPHONE BOOKINGS: 071 638 8891 (9.00AM– 8.00PM DAILY)

ADVANCE BOOKING: LEVEL 5. OPEN 9.00AM–8.00PM DAILY

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BY MR ZANDER CAN BE HEARD IN THE HALL AT 6.45PM.
ADMISSION FREE WITH YOUR TICKET TO THE CONCERT.

Critical acclaim for Zander's Mahler performances

"Benjamin Zander, endowed with some special kind of alchemy, conducted a spacious reverent performance as if it were a life commitment. The interpretation was convincing because Zander understood Mahler's musical and personal message." (Mahler Second)

Harriet Johnson – *New York Post*

"The second movement worked itself up to a feverish brilliance as the "Dances of Life" grew more and more grim and absurd. The Rondo Burlesque caught exactly the right sense of grotesquerie, of savage irony and berserk energy. And, finally, in the long, expansive adagio, there was affirmation, peace and reconciliation such as may only come to the most noble spirit." (Mahler Ninth)

Boston Herald American

"Benjamin Zander has developed a reputation in Boston as a conductor who can reveal, through carefully crafted readings, whole strata of new meanings in even the most frequently heard symphonic staples." (Mahler Third)

George W Harper – *The Patriot Ledger*

"The performance of the Third was, in a word, magnificent. Zander can be compared to great Mahlerians like Abbado and Horenstein. The careful balances and especially the forward-moving elasticity of phrasing and sensitivity to harmonic nuance contributed to what was one of the greatest performances of a Mahler slow movement I have ever heard." (Mahler Third)

Daniel L Farber – *Boston Jewish Advocate*

"Nothing could have been more beautiful than the Adagietto for strings and harp. Indeed, I don't think I've ever heard any orchestra play it more movingly, with more of a combination of elasticity and freedom in the phrasing." (Mahler Fifth)

Ellen Pfeiffer – *Boston Herald*

"Few Symphony concerts have had the quality of insight, of revelation, that Benjamin Zander's greatest performances have. The playing was a miracle of flexibility, both intimate and intense, even cataclysmic at certain climaxes, yet always, and above all, deeply moving . . . there I was, the music slowly wrapping me like a tourniquet, stopping my breath, squeezing out tears. (Mahler Fourth)

Lloyd Schwartz – *The Boston Phoenix*

Other titles of Zander with the Boston Philharmonic Orchestra on the IMP label include Stravinsky's *The Rite of Spring* (MCD 25) and Beethoven's *Symphony No. 9* (MCD 40).

USE YOUR HEAD CLUB NEWS

Notices

THE LONDON CELL IS CHANGING MORE THAN ITS LOCATION!

Michael V. Roman-Pintilie reports:

As Sue Whiting, who had brought such tremendous initiative and hard work to our cell, departed in June to concentrate mainly on the Radlett cell (thank you again, Sue!), Lady Mary Tovey has most kindly agreed to become joint leader of the London club. Her creativity and wide experience will now be even more of an asset to the club.

Starting in February, in addition to its renowned monthly 'meetings/lectures' on a wide range of subjects, a second monthly 'practice meeting' will focus on Mind Mapping and memory techniques. The facilities of the practice meetings may also be used for any other related subject that attracts sufficient members and a coach.

The following dates for 1995 are already decided.

Lecture meetings: 20 January, 17 February, 17 March, 21 April, 19 May, 16 June, 21 July.

Practice meetings: 3 February, 3 March, 7 April, 5 May, 2 June, 7 July.

All meetings are held at The London School of Economics, Houghton Street, London WC2 between 7pm and 10pm (check room number on arrival). Nearest stations: (underground) Aldwych, Temple, Holborn; (British Rail) Charing Cross and Blackfriars. For further information, please contact Michael V. Roman-Pintilie on 0181-372 1422 (from January 1) or Lady Mary Tovey on 0171-373 4457.

CURRENT BRAIN CELL CONTACTS IN SE ENGLAND

Bracknell	Ian Docherty	01344 862075
Canterbury	Warren Day	01227 760000 x 3824
Central London	Michael Roman-Pintilie	0181 372 1422
Hemel Hempstead	Penelope Dablin	01442 67637
Marlow	Phyllida Wilson	01628 477004
Radlett	Sue Whiting	01923 853765
SW London	Lady Mary Tovey	0171 373 4457

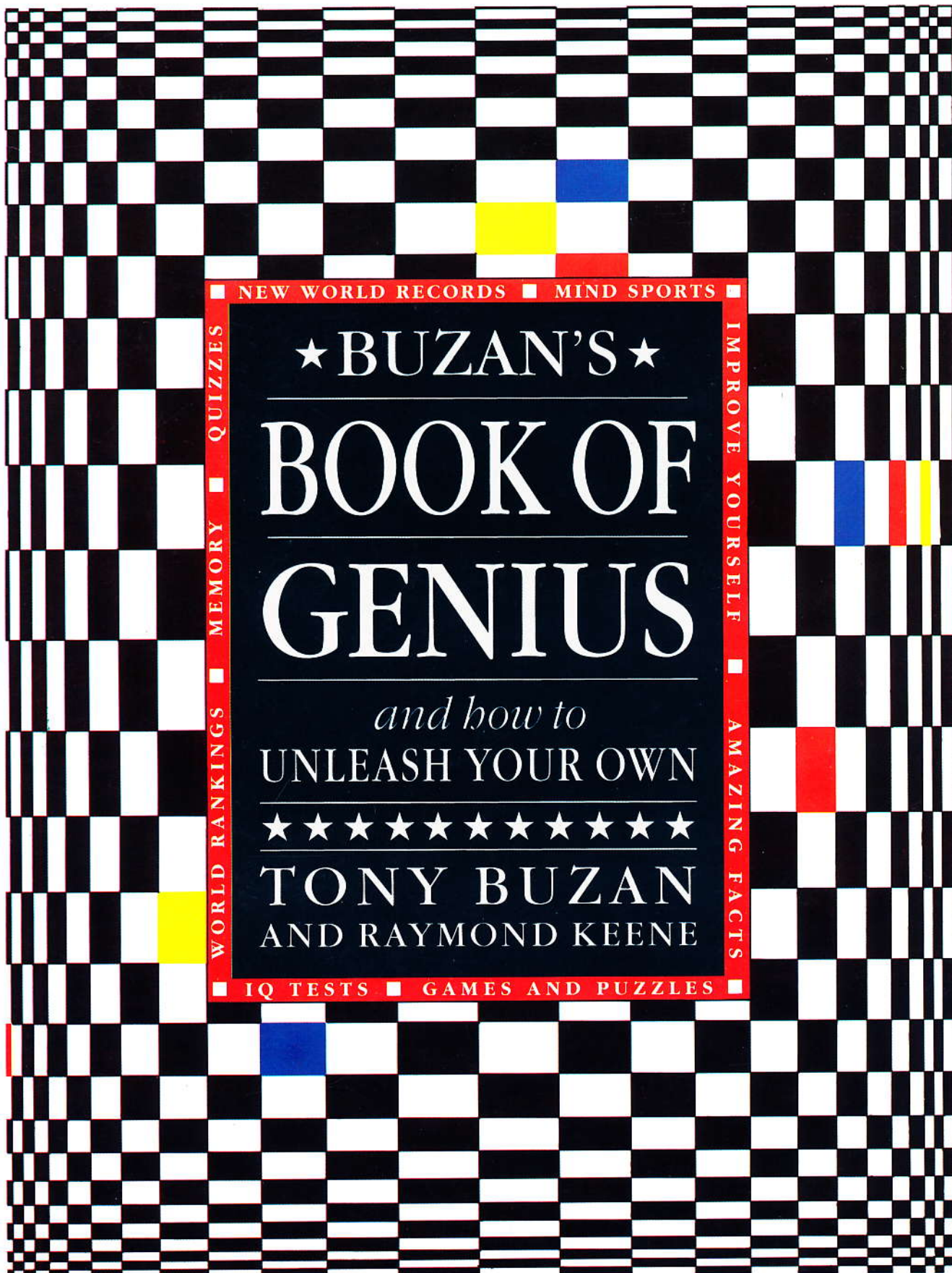
ADMINISTRATOR SOUGHT

The Brain Trust is seeking an administrator with fund-raising experience; remuneration to be negotiated. For further details please contact Lady Mary Tovey, The Brain Trust, 8 Cresswell Gardens, London SW5 OBJ, giving full details of past experience and qualifications.

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USE YOUR HEAD CLUB CONFERENCE 1995

This will be held at Simpson's-in-the-Strand on 24 June 1995. Please contact the Marlow address (see contents page) for further details.



Buzan's Book of Genius, price £14.95, is available in all good bookshops.
Alternatively, you can order direct from the publishers Stanley Paul (tel: 0171 973 9000).