	Results
1.	Burglars held, now I-T on BJP MP's tail Hindustan Times, July 10, 2014 Thursday, 305 words
2.	Four held with 76 bottles of illicit liquor Hindustan Times, March 19, 2014 Wednesday, 107 words
3.	Woman 'killed' by husband returns, was visiting facebook friend Hindustan Times, September 18, 2013 Wednesday, 259 words
4.	MAIN ACCUSED HELD IN MDU ANSWER SHEET LEAK CASE Hindustan Times, May 6, 2013 Monday, 181 words
5.	BJP MLA sanctions Rs. 10 lakh in Qasim Nagar The Northlines, January 25, 2013 Friday, 260 words
6.	The Particle at the End of the Universe, By Sean Carroll; The 'discovery' of the Higgs boson is a great event - but an anticlimax for lovers of the chase Independent.co.uk, December 3, 2012 Monday 11:07 AM GMT, REVIEWS, 512 words, Manjit Kumar
7.	Thinking in Numbers by Daniel Tammet: review; 'Thinking in Numbers' is an eclectic set of essays on maths and life by the autistic savant Daniel Tammet telegraph.co.uk, August 22, 2012 Wednesday 7:00 AM GMT, CULTURE, 748 words, By Manjit Kumar
8.	THE MAN WHO HARNASSED THE SUN Wall Street Journal Abstracts, July 14, 2012 Saturday, C; Pg. 9, 13 words, MANJIT KUMAR
9.	Off Message Sunday Business Post, June 10, 2012, AGENDA, 1011 words
10.	The Geek Manifesto: Why Science Matters, By Mark Henderson Independent.co.uk, June 7, 2012 Thursday 12:04 PM GMT, REVIEWS, 365 words, Manjit Kumar
11.	The Atheist's Guide to Reality By Alex Rosenberg Norton, £17.99 The Independent (London), April 18, 2012 Wednesday, Pg. 46, 370 words, MANJIT KUMAR
12.	Review: CRITICAL EYE: Luck, digital roots and quiet power The Guardian (London) - Final Edition, March 31, 2012 Saturday, GUARDIAN REVIEW PAGES; Pg. 15, 600 words
13.	ECHOES OF THE BIG BANG Wall Street Journal Abstracts, March 28, 2012 Wednesday, A; Pg. 11, 14 words, MANJIT KUMAR

14.	Turing's Cathedral by George Dyson: review; Manjit Kumar reviews Turing's Cathedral by George Dyson, which explores the creation of one of the first computers. telegraph.co.uk, March 27, 2012 Tuesday 11:26 AM GMT, 732 words, By Manjit Kumar

15.	Seeking a place in the cosmos; About Time: from Sun Dials to Quantum Clocks - How the Cosmos Shapes Our Lives, by Adam Frank, 432pp, Oneworld, £12.99 432pp telegraph.co.uk, March 26, 2012 Monday 4:06 PM GMT, 632 words, By Manjit Kumar

16.	Books The Daily Telegraph (London), March 24, 2012 Saturday, REVIEW;FEATURES; Pg. 25, 30 words

17.	Councillors joined in with the celebrations [...] Derby Evening Telegraph, February 20, 2012 Monday, NEWS; Pg. 8, 1 words

18.	10 ways to enrich your child's science education; How to get the best out of your child from 11 to 16. The teachers at Westminster School give you their point-by-point plan thetimes.co.uk, January 25, 2012 Wednesday 12:01 AM GMT, FREE PRIVATE EDUCATION, 2586 words

19.	MAN HELD AT AIRPORT WITH AMMUNITION Hindustan Times, November 16, 2011 Wednesday, 91 words

20.	Beauty spots in the book of nature; THE ART OF SCIENCE: A NATURAL HISTORY OF IDEAS by Richard Hamblyn Picador, £20, 485pp £18 from the Independent Bookshop: 08430 600 030 Arts & Book Review, November 4, 2011, BOOKS; Pg. 20, 680 words, Manjit Kumar

21.	The Quantum Universe: Everything That Can Happen Does Happen byBrian Cox and JeffForshaw: review; Manjit Kumar enjoys The Quantum Universe: Everything that Can Happen Does Happen by Brian Cox and Jeff Forshaw. telegraph.co.uk, October 24, 2011 Monday 11:37 AM GMT, 829 words, By Manjit Kumar

22.	Justine Picardie on Coco Chanel [...] The Daily Telegraph (London), October 22, 2011 Saturday, REVIEW;FEATURES; Pg. 25, 22 words

23.	When the esoteric becomes useful The Daily Telegraph (London), October 22, 2011 Saturday, REVIEW;FEATURES; Pg. 26, 842 words, Manjit Kumar

24.	Unlocking ancient energy; book of the week KNOCKING ON HEAVEN'S DOOR by Lisa Randall Bodley Head, £20, 442pp £18 from the Independent Bookshop: 08430 600 030 Arts & Book Review, September 16, 2011, BOOKS; Pg. 22, 1220 words, Review by MANJIT KUMAR

25.	The Month The Times (London), September 1, 2011 Thursday, EUREKA;FEATURES; Pg. 56,57, 703 words

26.	Summer Reading: My Favorite Science and Tech Books PC Magazine.com, August 1, 2011 Monday 5:36 PM EST, FORWARD THINKING, 852 words, Michael J.Miller

27.	Paperback Row The New York Times, June 26, 2011 Sunday, Section BR; Column 0; Book Review Desk; Pg. 36, 522 words, By IHSAN TAYLOR

28.	THE SCIENCE OF COMEDY; You don't have to leave your brain at the door when going to a gig. Manjit Kumar meets the comedian who is taking Brian Cox and other scientists on tour The Daily Telegraph (London), April 30, 2011 Saturday, REVIEW;FEATURES; Pg. 9, 975 words, Manjit Kumar

29.	Tracking the flight of time's arrow The Daily Telegraph (London), April 9, 2011 Saturday, REVIEW;FEATURES; Pg. 29, 719 words, Manjit Kumar

30.	Measuring multiverses; THE BOOK OF UNIVERSES by John D Barrow Bodley Head, £20, 354pp £18 from the Independent Bookshop: 08430 600 030 Arts & Book Review, March 25, 2011, BOOKS; Pg. 28, 572 words, Manjit Kumar

31.	The man who went nuclear; Science 100 years ago this week a Manchester University professor revealed the nuclear atom. Manjit Kumar explains how Ernest Rutherford ushered in the atomic age Independent Extra, March 3, 2011 Thursday, VIEWSPAPER; Pg. 10, 1560 words, Manjit Kumar

32.	The heretical idea of making people Mail & Guardian, February 23, 2011, 841 words, Manjit Kumar

33.	The heretical idea of making people Mail & Guardian, February 23, 2011, WORLD, 836 words, Manjit Kumar

34.	These dark materials The Times (London), February 12, 2011 Saturday, SATURDAY REVIEW;FEATURES; Pg. 10, 602 words, Manjit Kumar

35.	Culture under the microscope; Science A new exhibition features works made from cells, proteins and living tissue. Does this biological art belong in a gallery - or back in the lab? By Manjit Kumar Independent Extra, February 10, 2011 Thursday, VIEWSPAPER; Pg. 10, 962 words, Manjit Kumar

36.	Review: NON-FICTION: Manufacturing dissent: Manjit Kumar enjoys a thoughtful look at our fears about creating artificial life: Unnatural: The Heretical Idea of Making People by Philip Ball 373pp, Bodley Head, £20 The Guardian (London) - Final Edition, February 5, 2011 Saturday, GUARDIAN REVIEW PAGES; Pg. 8, 834 words, Manjit Kumar

37.	New Scientist January 22, 2011, OPINION;, 179 words, Manjit Kumar

38.	Our stealthy tech revolution Canwest News Service, December 28, 2010 Tuesday 11:02 AM EST, 656 words, Kate Heartfield, Postmedia News

39.	BEST BOOKS OF 2010 Austin American-Statesman (Texas), December 26, 2010 Sunday, INSIGHT; Pg. D01, 3243 words, AUSTIN AMERICAN-STATESMAN

40.	BJP's Protest rally in Doda The Northlines, December 7, 2010 Tuesday, 247 words

41.	The sun shines on a solar quest; CHASING THE SUN by Richard Cohen Simon & Schuster, £30, 682pp £27 from the Independent Bookshop: 08430 600 030 Arts & Book Review, December 3, 2010, BOOKS; Pg. 28, 782 words, Manjit Kumar

42.	Abraca-dazzler New Scientist, November 20, 2010, OPINION;, 517 words, Manjit Kumar

43.	New Scientist November 6, 2010, OPINION;, 183 words, Manjit Kumar

44.	EVENTS; The list The Times (London), November 4, 2010 Thursday, EUREKA;FEATURES; Pg. 56, 439 words

45.	New Scientist October 30, 2010, OPINION;, 196 words, Manjit Kumar

46.	Bid to grab property: Six arrested for preparing fake EPIC card Kashmir Times, October 25, 2010 Monday, 302 words, KT NEWS SERVICE

47.	A lot of hot air from the sceptics; The Monday Book MERCHANTS OF DOUBT By Naomi Oreskes & Erik M Conway BLOOMSBURY, £25 Order for £22.50 from the Independent Bookshop: 08430 600 030 Independent Extra, October 18, 2010 Monday, VIEWSPAPER; Pg. 14, 374 words, MANJIT KUMAR

48.	Review: NON-FICTION: Now and then: Manjit Kumar examines Roger Penrose's theory of the big bang: Cycles of Time: An Extraordinary New View of the Universe by Roger Penrose 288pp, Bodley Head, £25 The Guardian (London) - Final Edition, October 16, 2010 Saturday, GUARDIAN REVIEW PAGES; Pg. 8, 925 words, Manjit Kumar

49.	Captain Quantum New Scientist, October 16, 2010, OPINION;, 526 words

50.	History Simon Sebag Montefiore on the early Seventies The Sunday Telegraph (London), October 10, 2010, SEVEN;FEATURES; Pg. 27, 25 words

51.	HISTORY; Manjit Kumar hails a lucid account of Galileo's struggles with both celestial and temporal bodies The Sunday Telegraph (London), October 10, 2010, SEVEN;FEATURES; Pg. 30, 694 words, Manjit Kumar

52.	Bestsellers Edmonton Journal (Alberta), September 26, 2010 Sunday, BOOKS & ARTS; Pg. B2, 327 words, Edmonton Journal

53.	Arabian heights; nonfiction The Times (London), September 18, 2010 Saturday, SATURDAY REVIEW;FEATURES; Pg. 10, 723 words, Manjit Kumar

54.	Theories of everything; Stephen Hawking's new book dumps divine design in favour of spontaneous creation. Manjit Kumar asks if cosmic science has now written its last word Arts & Book Review, September 10, 2010, BOOKS; Pg. 22, 1631 words, Manjit Kumar

55.	There's a big bang in physics books The Daily Telegraph (London), September 7, 2010 Tuesday, FEATURES; Pg. 27, 646 words, Tom Chivers

56.	Book Smarts; From mysteries to histories, reports on what the city's top minds are reading this summer The Toronto Star, August 9, 2010 Monday, NEWS; Pg. A3, 1633 words

57.	A matter of faith New Scientist, August 7, 2010, OPINION;, 712 words, Manjit Kumar

58.	At 82, Mose goes and goes; Singer-pianist releases first new material in 10 years The Vancouver Sun (British Columbia), July 26, 2010 Monday, ENTERTAINMENT; Pg. C3, 352 words, Marke Andrews, Vancouver Sun

59.	Leaping into the history of quantum theory Providence Journal, July 25, 2010 Sunday, FEATURES; Arts/Travel; Pg. 5, 599 words, Sam Coale, Special to the Journal

60.	At 82, jazz great Mose Allison goes and goes Canwest News Service, July 21, 2010 Wednesday 07:01 PM EST, 593 words, MARKE ANDREWS, Vancouver Sun

61.	Elusive stuff New Scientist, July 17, 2010, OPINION;, 490 words, Manjit Kumar

62.	DEBATE CANCELLED Birmingham Evening Mail, July 13, 2010 Tuesday, NEWS; Pg. 11, 17 words

63.	Salon set for theory debate Birmingham Evening Mail, June 24, 2010 Thursday, NEWS; Pg. 16, 49 words

64.	Editors' Choice: Recent books of particular interest The New York Times, June 20, 2010 Sunday, Section BR; Column 0; Book Review Desk; Pg. 18, 301 words

65.	Random Acts of Science The New York Times, June 13, 2010 Sunday, Section BR; Column 0; Book Review Desk; Pg. 25, 1264 words, By GRAHAM FARMELO. Graham Farmelo is the author of "The Strangest Man," a biography of Paul Dirac.

66.	A new golden age of science writing; Bestsellers are making us experts in everything from cosmology to clocks, says Graham Farmelo The Times (London), June 5, 2010 Saturday, SATURDAY REVIEW;FEATURES; Pg. 8, 2303 words, Graham Farmelo

67.	Calgary Bestsellers The Calgary Herald (Alberta), May 23, 2010 Sunday, CONTEXT; Pg. B5, 267 words, Calgary Herald

68.	"Quantum": When physics got spooky Salon.com, May 23, 2010 Sunday, LAURA MILLER, 1004 words, Laura Miller

69.	Quantum: Einstein, Bohr, and the Great Debate about the Nature of Reality Publishers Weekly Reviews, March 1, 2010, REVIEWS; Nonfiction; Pg. 44, 221 words, Staff

70.	Pick of the paperbacks The Sunday Times (London), July 5, 2009, CULTURE;FEATURES; Pg. 50, 586 words

71.	True stories and lost lives; Does Philip Hoare's victory in the Samuel Johnson Prize with a whale of a tale confirm that formal biography is now a dying art? Boyd Tonkin reports Arts & Book Review, July 3, 2009, BOOKS; Pg. 26, 1779 words, Boyd Tonkin

72.	THERE'S NOW A SCIENCE TO WRITING GREAT BOOKS The Evening Standard (London), July 1, 2009 Wednesday, 625 words

73.	WRITER USES PRIZE TO PLEAD FOR ENDANGERED WHALES The Evening Standard (London), July 1, 2009 Wednesday, 201 words, LOUISE JURY CHIEF ARTS CORRESPONDENT

74.	National: Whale tale wins £20,000 prize for non-fiction The Guardian (London) - Final Edition, July 1, 2009 Wednesday, GUARDIAN HOME PAGES; Pg. 8, 340 words, Mark Brown, Arts correspondent

75.	Whale of a tale wins British nonfiction book prize The Associated Press, June 30, 2009 Tuesday, ENTERTAIN-

	MENT NEWS, 224 words

76.	Bad Science is good bet for Samuel Johnson prize Guardian.com, June 30, 2009 Tuesday, 420 words

77.	'Classic' study of whales wins Samuel Johnson prize Guardian.com, June 30, 2009 Tuesday, 513 words

78.	WHALE BOOK WINS LITERARY AWARD Press Association Mediapoint, June 30, 2009 Tuesday 7:57 PM BST, HOME NEWS, 603 words, Vicky Shaw, Press Association Arts Correspondent

79.	Science and wonder take the prize; WEEKEND BOOKS The only major prize for a non-fiction work will be awarded next week and the shortlist inevitably reÕects a wide variety of subjects and approaches. CHRISTOPHER SILVESTER takes a look The Express, June 26, 2009 Friday, COLUMNS; 52, 616 words

80.	BBC Samuel Johnson Prize For Non-Fiction Future News - Media Planner, June 25, 2009 Thursday, ENTERTAINMENT, 84 words

81.	Review: Books: PAPERBACK OF THE WEEK: It's time to get physical: Quantum: Einstein, Bohr and the Great Debate About the Nature of Reality, Manjit Kumar Icon Books £9.99 The Guardian (London) - Final Edition, June 21, 2009 Sunday, OBSERVER REVIEW BOOKS PAGES; Pg. 25, 334 words, SOPHIA MARTELLI

82.	Manchester Evening News June 18, 2009 Thursday, BUSINESS; Pg. 3, 107 words

83.	Samuel Johnson Prize: the shortlist telegraph.co.uk, May 28, 2009 Thursday 11:45 AM GMT, BLOG, 326 words, By Sameer Rahim

84.	BAD BANKERS AND DODGY SCIENCE IN THE RUNNING FOR BEST NON-FICTION The Evening Standard (London), May 21, 2009 Thursday, 413 words

85.	Big names edged out in science-heavy Samuel Johnson prize shortlist Guardian.com, May 21, 2009 Thursday, 452 words

86.	ROYAL SOCIETY PRIZE FOR SCIENCE BOOKS LONGLIST ANNOUNCED States News Service, May 21, 2009 Thursday, 444 words, States News Service

87.	Science dominates Samuel Johnson prize longlist Guardian.com, May 14, 2009 Thursday, 850 words

88.	Paperback Picks; Our editors select the best in softcover reading New Scientist, April 25, 2009, OPINION; Books & Arts; Pg. 45, 158 words, Eleanor Harris

89.	nonfiction; paperbacks The Times (London), April 11, 2009 Saturday, SATURDAY REVIEW;FEATURES; Pg. 10, 524 words, Anjana Ahuja

90.	Understanding quantum physics and relativity Cape Argus (South Africa), April 06, 2009 Monday, LIFE; Pg. 13, 453 words

91.	PAPERBACKS; Doing Without Delia By Michael Booth VINTAGE £7.99 (319pp) (free p&p) from the Independent Bookshop: 0870 079 8897 Arts & Book Review, April 3, 2009, BOOKS; Pg. 32, 1320 words, Reviewed by Christopher Hirst, Boyd Tonkin & Katy Guest

92.	Saturday Review: Paperbacks: NICHOLAS LEZARD'S CHOICE: Quantum with solace: Quantum: Einstein, Bohr, and the Great Debate About the Nature of Reality, by Manjit Kumar (Icon, £9.99) The Guardian (London) - Final Edition, March 28, 2009 Saturday, GUARDIAN REVIEW PAGES; Pg. 19, 665 words, NICHOLAS LEZARD

93.	Quantum: Einstein, Bohr and the Great Debate About the Nature of Reality; by Manjit Kumar; 448pp, Icon Books, pounds 20; T pounds 18 (plus pounds 1.25 p&p) 0844 871 1515; The solace ofquantum The Daily Telegraph (London), December 13, 2008 Saturday, BOOKS; Pg. 23, 738 words, Andrew Crumey

94.	Collisions with the solace of quantum; Quantum By Manjit Kumar ICON £20 (448pp) £18 (free p&p) from 0870 079 8897 Arts & Book Review, December 5, 2008, BOOKS; Pg. 34, 610 words, ANDY MARTIN

95.	Saturday Review: The mischievous oracle: A brilliant guide to quantum physics impresses Steven Poole: Quantum: Einstein, Bohr, and the Great Debate About the Nature of Reality by Manjit Kumar 448pp, Icon, £20 The Guardian (London) - Final Edition, November 15, 2008 Saturday, GUARDIAN REVIEW PAGES; Pg. 7, 1028 words, Steven Poole

96.	Also published this week... Scotland on Sunday, October 12, 2008, Sunday, Pg. 12, 270 words

97.	Exploring the mysteries of the world at a microphysical level The Irish Times, October 9, 2008 Thursday, OPINION; Opinion; Pg. 15, 660 words

98.	Unlicensed limo firm boss fined Birmingham Evening Mail, August 22, 2008 Friday, NEWS; Pg. 22, 156 words

99.	MOVE TO POPULARISE GEO-PARK CONCEPT Hindustan Times, January 30, 2007 Tuesday 1:51 AM EST, 625 words, Report from the Assam Tribune brought to you by the Hindustan Times

100.	South City News: Birmingham Magistrates Birmingham Evening Mail, December 22, 2005, Thursday, NEWS; Pg. 22, 720 words

101.	Blood, sweat and imagination; Seven Wonders of the Industrial World by Deborah Cadbury; Fourth Estate 376pp £ 20 (£ 17) Guardian Weekly, November 26, 2003, BOOKS; Pg. 17, 686 words, Reviewed by Manjit Kumar

102.	Blood, sweat and imagination: Manjit Kumar salutes the visionary creators of the seven wonders of the modern age: Seven Wonders of the Industrial World by Deborah Cadbury 376pp, Fourth Estate, $:20 The Guardian - Final Edition, November 8, 2003, Guardian Saturday Pages, Pg. 11, 853 words, Manjit Kumar

103.	Challenging a golden rule of modern physics; Faster Than the Speed of Light: The Story of a Scientific Speculation by Joao Magueijo; Heinemann 320pp £ 16.99 (£ 14.99) Guardian Weekly, April 16, 2003, BOOKS; Pg. 17, 762 words, Reviewed by Manjit Kumar

104.	SATURDAY REVIEW: Summing up the universe: Manjit Kumar is gripped by a challenge to one of the central tenets of modern physics The Guardian (London), March 29, 2003, Guardian Saturday Pages, Pg. 13, 857 words, Manjit Kumar

105.	So You Don't Think You Need Poetry? The Times Higher Education Supplement, November 24, 2000, SCIENCE JOURNALS; BOOKS; No.1463; Pg.42, 927 words, Susan Blackmore

106.	The appliance of science The Irish Times, May 28, 1997, CITY EDITION, NEWS FEATURES; BOOK OF THE DAY; Pg. 18, 702 words, By MANJIT KUMAR

107.	Brave new worlders; Philosophy; Books The Times Higher Education Supplement, February 2, 1996, Issue 1213, Pg.28, 773 words, MARTYN KELLY

108.	The simple truth about complexity; Homeview; Opinion The Times Higher Education Supplement, December 22, 1995, Issue 1207, Pg.12, 601 words, GEOFF MULGAN

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1 of 108 DOCUMENTS

Hindustan Times

July 10, 2014 Thursday

Burglars held, now I-T on BJP MP's tail

LENGTH: 305 words

DATELINE: Patna

Patna, July 10 -- A theft at BJP MP Giriraj Singh's apartment in Patna on Monday and subsequent recovery of ' 1.14 crore cash, $600 and other valuables within a few hours took a new turn with the income tax (I-T) authorities taking cognizance of the huge cash haul.

Police recovered the stolen stash from an auto-rickshaw and arrested four people, including Virendra Kumar - the security guard at the apartment who was a suspect as he had escaped soon after the incident - and Dinesh Kumar alias Guddu, who was driving the auto rickshaw along with two of the Nawada MP's aides.

As soon as the police claimed to have solved the case, I-T authorities sprung into action and collected details about theft and subsequent recovery of the cash.

"We are looking into the matter," said an I-T officer, without elaborating any further.

Singh was quoted on TV channels saying that the theft at his flat was a 'political conspiracy'.

He said the money burgled from his house was not his but belonged to his cousin.

However, the incident soon took political overtones soon. JD(U) leaders wanted an investigation into the matter as to how such a big unaccounted cash was found at MP's residence.

"Singh should be arrested for hiding such a huge amount of unaccounted cash in his house, which was stolen and now recovered by police," JD(U) legislator **Manjit Kumar** Singh said.

"It has exposed BJP's real face again," he added.

RJD legislator Bhai Dinesh also questioned the source of cash recovered by the police.

"If the huge cash amount is white (legal), then why did Singh in his complaint to police say only ' 50,000 was stolen from his house?" he asked.

LOAD-DATE: July 9, 2014

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newswire

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2 of 108 DOCUMENTS

Hindustan Times

March 19, 2014 Wednesday

Four held with 76 bottles of illicit liquor

LENGTH: 107 words

DATELINE: Nakodar

Nakodar, March 19 -- The police have arrested Manprret Singh, a resident of Mohalla Baghiarpur, and Ashok Kumar of Laheyewal on charges of selling illicit countrymade liquor. As many as 59 bottles of hooch were recovered from their possession. The police also arrested **Manjit Kumar** of Kandola Kalan and Buta Singh of Sangowal village with 17 bottles of hooch. A case under the Excise Act has been registered against the accused, the police said.

LOAD-DATE: March 18, 2014

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newswire

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3 of 108 DOCUMENTS

Hindustan Times

September 18, 2013 Wednesday

Woman 'killed' by husband returns, was visiting facebook friend

LENGTH: 259 words

DATELINE: Muzaffarpur

uzaffarpur, Sept. 18 -- Languishing in jail for the past 16 days for killing his wife for dowry, 25-year-old **Manjit Kumar** finally got a respite after his wife was found very much alive at the Muzaffarpur railway station.

A civil court lawyer, Manjit married 21-year-old Neha Kumari on April 28 this year. On August 26, Neha's mother lodged an FIR claiming that Manjit and his family members had killed her daughter for dowry and disposed of her body.

"The family members of my son-in-law not only murdered my daughter, they even got her body secretly

disposed of," wrote Poonam Devi in the FIR.

She further alleged that Manjit had an illicit relationship with another girl and he wanted to get rid of her daughter. "He demanded Rs. 4 lakh as dowry and used to beat my daughter," she said in the complaint.

Confirming Neha's 'arrest' from the railway station, Muzaffarpur town deputy superintendent of police (DSP) Upendra Kumar said on Wednesday evening that she was being questioned.

"We are quizzing her. Soon, we will be able to get to the bottom of the matter and find out what she had been up to and whether her parents had a hand in her disappearance," said the DSP.

Another police source claimed Neha had confessed that she was away "visiting a facebook friend in Darbhanga" during the duration of her disappearance. However, the police didn't confirm this.

LOAD-DATE: September 19, 2013

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newswire

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4 of 108 DOCUMENTS

Hindustan Times

May 6, 2013 Monday

MAIN ACCUSED HELD IN MDU ANSWER SHEET LEAK CASE

LENGTH: 181 words

DATELINE: Rohtak

Rohtak, May 6 -- More than three months after the Maharshi Dayanand University (MDU) answer sheet leak case came to light, police on Sunday claimed to have made a breakthrough by arresting main accused Vikas Dangi.

Police said it was Dangi, 25, who threw nearly 2,000 unmarked answer sheets on the terrace of university's administration block on January 21. Police have arrested six people, including secrecy branch superintendent Surender Maratha. It was found that 66 answer sheets were tampered with.

Dangi confessed that it was him and his two friends, who threw unmarked answer sheets on the terrace of the administration block, police said. Dangi said he along with his friends, Jaimini and **Manjit Kumar,** took

money (in thousands) from 20 students studying at a degree college in Bahadurgarh in return for increasing their marks by replacing the unmarked answer sheets with fresh ones. Published by HT Syndication with permission from HT Chandigarh. For any query with respect to this article or any other content requirement, please contact Editor at htsyndication@hindustantimes.com

LOAD-DATE: May 5, 2013

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newswire

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5 of 108 DOCUMENTS

The Northlines

January 25, 2013 Friday

BJP MLA sanctions Rs. 10 lakh in Qasim Nagar

LENGTH: 260 words

Jammu, Jan. 25: Jammu East MLA of Bharatiya Janata Party Ashok Khajuria, along with District President Jammu Mahanagar Rajesh Gupta, visited Qasim Nagar locality in Ward No. 19 of his constituency and got the work for diversion of drains besides total repair of lanes and drains started in presence of a large number of party activists and the local residents.

Ashok Khajuria made available an amount of rupees ten lakh from his Constituency Development Fund (CDF).

Addressing the gathering on this occasion, Ashok Khajuria said that Qasim Nagar area houses the population of the poor people and needs more attentions in all matters. He said that after becoming MLA of Jammu East, I have been in regular touch with the people of this area and have in the past undertaken personal visits for having on the spot assessment of their problems. He assured the local residents of his continuous support to their genuine needs and demands.

Taking a dig at NBCC, Ashok Khajuria blamed this agency of turning whole of Jammu city into debris. He said that for the last few years every street and road of Jammu city has been dugged badly and made totally uncomfortable for the people and vehicles by NBCC but there is no one to pull it for doing so. He said that the matter has been taken up with the government many times but unfortunately hollow assurances are given and on ground the situation has not changed.

Kuldeep Kandhari, Sunil Dogra, Gurcharan Singh, Arun Sethi, Raju Pahalwan, Gharu Pahalwan, Babbi, Ashok Lamber, **Manjit Kumar** and others were present on the occasion.

LOAD-DATE: January 26, 2013

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newspaper

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The INDEPENDENT
Independent.co.uk

December 3, 2012 Monday 11:07 AM GMT

The Particle at the End of the Universe, By Sean Carroll; The 'discovery' of the Higgs boson is a great event - but an anticlimax for lovers of the chase

BYLINE: **Manjit Kumar**

SECTION: REVIEWS

LENGTH: 512 words

On 4 July 2012, hundreds had queued for hours for the 9am event; many had camped out all night. Although journalists from across the globe had arrived in huge numbers, this was no launch of the latest must-have Apple product or the reformation of some ageing rock band.

The venue was CERN, Europe's centre for high-energy particle physics near Geneva, and the event was the official presentations of the latest data in the search for the world's most famous yet-to-be discovered particle, the Higgs boson.

Get money off this book online at the Independent Bookshop

The handful of graphs from the two major experiments, ATLAS and CMS, that collect and analyse data generated by collisions in the Large Hadron Collider (LHC) would have seemed unimpressive to the untutored eye, explains Sean Carroll, a theoretical physicist at the California Institute of Technology. But they signalled, to the physicists in the audience, the culmination of decades of work and $9 billion in hard cash, and a new particle.

In The Particle at the End of the Universe, Carroll offers some words of caution amid the Higgsteria. What has been found is evidence for a very Higgs-like particle: "It has the right mass, it is produced and decays in roughly the expected ways". In truth, physicists don't want it to be the Higgs that theory predicts. It's always more interesting to find something unexpected. "Like Hollywood celebrities or charismatic politicians,

scientific theories are put on a pedestal just so we can tear them down".

The best theory of particle physics, the "standard model", describes quarks, gluons, neutrinos and all the other particles and the forces that act between them. The Higgs is the missing piece of the theory and plays a special role in giving other particles mass. It dates back, and is named after, work done by Peter Higgs in Edinburgh in 1964.

Searching for the Higgs particle has been likened to looking for a bit of hay in a haystack. If all the data generated by the LHC were stored on CDs, it would fill more than a million discs every second. To overcome this problem detectors are designed to select data passed on for storage. The system that performs the selection process is called the trigger. It is the role Carroll plays in this compelling addition to the ever-growing list of books on the physics of which the Higgs is such a crucial component.

In a rare omission, Carroll fails to mention the first circular accelerator. Called the cyclotron, it was a pie-sized fabrication of glass, sealing wax, bronze, only 4.5 inches in diameter. In 1931, the American Ernest Lawrence's idea of using magnetic fields to help accelerate particles would launch the era of "Big Science" that would lead to the LHC, with a diameter of 8.6km and circumference of 27km.

Though not always easy reading, Carroll's book reveals that modern physics at the cutting edge requires extraordinary devotion and a willingness to bet high stakes in search of unique rewards. As he says, "When it all comes together, the world changes."

Manjit Kumar's 'Quantum' is published by Icon Books

LOAD-DATE: December 3, 2012

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Web Publication

JOURNAL-CODE: WEBI

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The Telegraph
telegraph.co.uk

August 22, 2012 Wednesday 7:00 AM GMT

Thinking in Numbers by Daniel Tammet: review; 'Thinking in Numbers' is an eclectic set of essays on maths and life by the autistic savant Daniel Tammet

BYLINE: By **Manjit Kumar**

SECTION: CULTURE

LENGTH: 748 words

Pi is a number that has gripped the imagination of many a mathematician, professional and amateur, throughout history. It's the number that is always generated when the circumference of a circle is divided by its diameter. Its special appeal lies in the fact that it has no last digit; it starts 3.14159265 and goes on forever. On March 14 2004, Daniel Tammet publicly recited from memory pi to 22,514 decimal places. It took him five hours and nine minutes.

"Printed out on crisp, letter-sized sheets of paper, a thousand digits to a page, I gazed on them as a painter gazes on a favourite landscape", writes Tammet in his new book, before going on to try to explain how he accomplished the near impossible.

His astonishing feat of memory would not surprise the readers of his two previous memoirs, Born on a Blue Day (2006) and Embracing the Wide Sky (2009). Tammet was diagnosed eight years ago with high-functioning autistic savant syndrome; as he puts it, "the connections in my brain, since birth, had formed unusual circuits." While the rest of us are barely aware of the way in which the interplay between numerical concepts saturates the way we experience the world, Tammet is able to join the dots with startling lucidity.

Thinking in Numbers is a collection of 25 essays in which Tammet explores what he calls "the maths of life". The book, he writes, "entertains pure possibilities", immune to prior experience or expectation. "The fact that we have never read an endless book," he writes, "or counted to infinity, or made contact with an extraterrestrial civilization should not prevent us from wondering: what if?"

Inevitably Tammet's choice of subjects is personal, and wonderfully eclectic. Several pieces are biographical, prompted by imagining a young Shakespeare learning about zero, a new idea in 16th-century schools, or the calendar created for the Sultan Jalal al-Din by the poet and mathematician Omar Khayyám that was more accurate than the later Gregorian version. Other essays were inspired by the snows of Quebec, counting sheep in Iceland, and the debates of ancient Greece which shaped the development of the Western mathematical imagination.

What lifts Tammet's entertaining collection above the ordinary are the often surprising links that he sees, explores and explains. In "Shapes of Speech" he connects Pythagoras and Euclid, mathematics and rhetoric, to Abraham Lincoln's defence of the Union as America edged towards civil war. "We are not enemies," Lincoln had said, "but friends." Perhaps, says Tammet, Lincoln was thinking of a proverb attributed to Pythagoras: "Friendship is equality."

In "Proverbs and Times Tables", Tammet suggests that one hundred proverbs sum up the essence of a culture. One hundred multiplication facts (two times two is four, seven times six is 42 etc) compose the times tables. Like proverbs, these numerical statements are always short, fixed, and pithy, yet they don't stick in our heads as proverbs do. If only multiplication tables could be constructed in a form that was as memorable as that of a proverb, says Tammet, many youthful blushes, and even those of the odd world-class mathematician, would be spared. For Tammet, form is all-important.

The interplay between words and numbers is a recurring theme. In a fine essay, "Poetry of the Primes", he explores the relationships between two verse forms - the sestina and the haiku - and prime numbers. The haiku's three lines contain three, five and seven syllables. Three, five and seven are the first three odd primes. The power of the sestina relies on repetition. The same six words, one at the end of each line, persist and permute across every stanza. The order in which the concluding words of each line rotate is fixed according to an intricate mathematical pattern. "Poetry and prime numbers have this in common," concludes Tammet, "both are as unpredictable, difficult to define and multiple-meaning as life."

Readers of Tammet's autobiographies - which were bestsellers in the US and on the continent - continue to write to him. "They seek the same beauty and emotion that I find in both a poem and a prime number", he writes. "What can I tell them?" Tammet, who knows that the circle that pi describes is perfect, belonging exclusively to the realm of imagination, has only one answer: "Imagine."

Thinking in Numbers: How Maths Illuminates our Lives

Daniel Tammet

Hodder & Stoughton, £18.99, 229pp

LOAD-DATE: August 23, 2012

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Web Publication

JOURNAL-CODE: WEBDTNS

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Wall Street Journal Abstracts

July 14, 2012 Saturday

THE MAN WHO HARNASSED THE SUN

BYLINE: **MANJIT KUMAR**

SECTION: C; Pg. 9

LENGTH: 13 words

ABSTRACT

Manjit Kumar reviews book Nuclear Forces, by Silvan Schweber; photo (M)

LOAD-DATE: July 15, 2012

LANGUAGE: ENGLISH

GRAPHIC: Photograph

DOCUMENT-TYPE: Review

PUBLICATION-TYPE: Newspaper

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THE SUNDAY BUSINESS POST
IRELAND'S FINANCIAL, POLITICAL AND ECONOMIC NEWSPAPER
Sunday Business Post

June 10, 2012

Off Message

SECTION: AGENDA

LENGTH: 1011 words

For years, I thought it was just me. I would find myself surreptitiously doing it on planes, in the park, on the beach -- anywhere people are to be found alone in a crowd.

My neck would jerk like the limbs of a startled newborn, and begin craning and twisting to have a look at what they were reading. At parties, at some point in the evening, I would eventually discover myself in the sitting room or the hall, greedily scanning bookshelves.

I told myself it's because I wanted to expand my own literary horizons, but of course that's not the whole truth. Discovering what people read is like finding out what someone looks like naked, what kind of drunk they are or how they behave when they're alone with their spouse.

As Oscar Wilde said, it is what you read when you don't have to, that determines what you will be when you can't help it.

I don't think I could have married a man who listed The Da Vinci Code as his favourite book, for instance. And I'm no Harold Bloom (he once said he'd prefer children didn't read at all than they read Harry Potter), but I did have to give serious thought to a relationship after I discovered a then boyfriend had packed a suitcase for holidays with some back issues of the Reader's Digest. Yes, that was our last holiday together.

Other people feel the same about friends and lovers who listen to Celine Dion or Nickelback; for me, it's their taste in books that's the deal-breaker. It's not just that I'm a literary snob; it's more I suspect that, once we got beyond the superficialities, we wouldn't have much in common.

I discovered that this sordid little habit was not peculiar to me when I read a piece a few years ago by Nick Hornby, in which he not only confessed to obsessively doing the same thing, he even gave it a name:

xenagorabibliomania.

The dawn of the e-reader has been hell for xenagorabibliomaniacs like me and Nick. There's no more involuntary neck craning in the park or by the pool on holidays -- everyone is reading the same thing. A trim, plastic-cased volume in black, white or grey.

In most other ways, though, I welcome the age of the Kindle. I use mine daily; and it is a tribute to its portability and its immediacy that I've at least trebled my reading volume since I got it. (Perhaps it's an acknowledgement of this reality that led Waterstones to recently bury the hatchet with Amazon, and start stocking the Kindle in its stores.)

But the prospect of an end to my days of literary rubbernecking is the one thing about the demise of the physical paperback that makes me sad. Even bestseller lists can only tell you so much about what others are reading.

One in every four books sold on Amazon comes from outside its top 100,000 titles. Which is just as well: I don't know if I could survive in a world where everyone was reading diet tomes and The Hunger Games.

Last week, I conducted my own survey of my Twitter followers. More than 75 people replied to my request to know what they were reading and, amazingly, only two titles appeared with any regularity in my feed -- the housewives' erotica Fifty Shades of Grey and Run, Fat Bitch, Run, the motivational exercise book with the catchier-than-usual title.

The rest made for an esoteric and surprising selection. They ranged from the intellectual (Quantum, by **Manjit Kumar;** The Epigenetics Revolution by Nessa Carey; and Mutants: What The Study of Human Deformity and Variation Tells Us About Our Genes by Armand Marie-Leroi) to the entertaining (John Grisham, Jackie Collins and the "pacier Lord of the Rings", A Song of Ice and Fire by George RR Martin).

There were some topical choices, like Kathleen MacMahon's This Is How It Ends; The Watch by Joydeep Roy-Bhattacharya (Amazon's book of the month); along with more offbeat ones, like The Art Of Fielding by Chad Harbach and 1961's The Death & Life of Great American Cities by Jane Jacobs.

It's the range of responses that, more than anything, gives me hope for the future of the written word. Because, in spite of all the dire predictions about the slow and inexorable death of publishing, the fact is that many people are still hoovering up books in all their formats.

In the US, the value of sales of e-books outpaced paperbacks for the first time a year ago -- but at last week's annual publishing convention, it was revealed that the number of independent bookstores there had also grown for the third year running.

Delegates at the same convention got a glimpse into the future of publishing, when the new "augmented reality" Sony Wonderbook (co-written by JK Rowling) was unveiled. Yes, many of them will have thrown down their tweed caps and their copies of Harold Bloom in horror at the notion of a Harry Potter book that's also a PlayStation-type game, but that's what they were doing five years ago about the prospect of the e-book.

The point is, despite the challenges of the digital revolution, there's much to be optimistic about in the future of literature. Publishers may be fearful of Amazon (and perhaps they're right to be), but e-readers are not the enemy of books; in Ireland, they're estimated to account for just 1 per cent of book sales. And even as that share grows -- because it will -- does it really matter how people read, as long as they read?

There's a little part of me that continues to find the human desire to read anything you can get your hands on miraculous, and thrilling. Irish people still love books, writing and book festivals. (Next week, I'll be one of thousands of book lovers descending on Dalkey for its three-day Book Festival, which includes readings by Maeve Binchy and Seamus Heaney.)

Books are what divide us and bring us together. We read because we are; we are because we read.

The Dalkey Book Festival features more than 50 events, including a discussion entitled Will Booklovers Fight Back? Jennifer O'Connell will be chairing a panel discussion entitled How To Write A Bestseller, with authors Monica McInerney, Sinéad Moriarty, Marita Conlon-McKenna and Sarah Webb on Sunday at 1pm. Tickets from dalkeybookfestival.org

twitter.com/jenoconnell

LOAD-DATE: June 10, 2012

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newspaper

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The INDEPENDENT

Independent.co.uk

June 7, 2012 Thursday 12:04 PM GMT

The Geek Manifesto: Why Science Matters, By Mark Henderson

BYLINE: **Manjit Kumar**

SECTION: REVIEWS

LENGTH: 365 words

Isaac Newton was twice elected an MP for Cambridge University. Beyond asking for a window to be closed, there is no record that he ever spoke in a debate. More than three centuries later, just one of today's 650 MPs, Julian Huppert, the Lib-Dem member for Cambridge, has been a research scientist. Only two others have a science PhD.

"What science admires as intellectual honesty is seen in Whitehall as the stuff of the gaffe," argues Mark Henderson in The Geek Manifesto. It is one reason why so few trained in the sciences pursue a political career. Changing your mind when confronted with new evidence is at the heart of being a scientist, but for a politician it often leads to being charged with a lack of conviction.

As Henderson points out, science is far more than just a body of knowledge; it is a way of thinking. The former science editor of The Times makes a persuasive case for his central proposition: "A more scientific approach to problem-solving is applicable to a surprisingly wide range of political issues, and that ignoring it

disadvantages us all". The problem, argues Henderson, is that politicians, policy wonks and opinion-formers rarely grasp the value of science. If not indifferent, then for many across the political spectrum, science is an optional extra, to be used when it suits an agenda.

"Precisely what politicians think is less important than how they think." It's a point that Henderson repeatedly drives home in his passionate answer to why science matters. Changing how politicians think, he hopes, will shape what they think on how best to teach children, prevent crime, fund healthcare and protect the environment.

There are many types of abuse of scientific data by politicians seeking justification for policy-based evidence. Politicians get away with this, argues Henderson, because abusing and undervaluing science carries no political cost. Yet about 3 million people in Britain have some sort of science background.

Henderson urges geeks to mobilise into a political force "that punches its weight" in the fight for evidence-based policy. The Geek Manifesto should be required reading for all those who question the value and importance of science.

LOAD-DATE: June 8, 2012

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Web Publication

JOURNAL-CODE: WEBI

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The INDEPENDENT

The Independent (London)

April 18, 2012 Wednesday
First Edition

The Atheist's Guide to Reality By Alex Rosenberg Norton, £17.99

BYLINE: **MANJIT KUMAR**

SECTION: Pg. 46

LENGTH: 370 words

There are plenty of books that make the case for atheism, but Alex Rosenberg's The Atheist's Guide to Reality isn't one of them. The American philosopher maintains that religious belief is immune to rational objection. There's little point, argues Rosenberg, in preaching to the unconverted. His aim is to enlighten the converted by arguing for what an atheist should believe, since there's more to atheism than simply "there is no God". He begins by rebranding atheism as "scientism" so as to better describe what atheists "do believe". First, an atheist has to understand the science, then accept its "irrefutably correct answers to the persistent questions". What is the nature of reality? What physics says it is. What is the purpose of the universe? There is none. What is the meaning of life? Ditto.

Rosenberg's scientism is built on accepting well-established laws of physics as the basic description of reality. He argues that the physics tells us just about everything we need to know about how the universe works. We can extend this to chemistry and biology, and then, with an appeal to Darwinian processes, everything else. For Rosenberg, almost everything we think of as having inherent value or meaning, from morality to the idea of a self, does not. He wants us to let go of our many illusions, such as the concept of free will. Being "scientistic" means treating science as the "exclusive guide to reality" and accepting that it "enables atheism to answer life's universal and relentless questions".

Rosenberg argues that atheists are assailed on all sides by attempts to sow doubt about the completeness and credibility of science. Worse still, some of those questioning the reach of science are people with impeccable scientific qualifications. Rosenberg wants to clarify "what our attachment to science... really commits us to".

There's much that Rosenberg writes one can agree with; as for the rest, it's at least thought-provoking. If you can't swallow science's answers as interpreted by Rosenberg, he has one last piece of advice: "Take a Prozac or your favourite serotonin reuptake inhibitor, and keep taking them till they kick in."

Order for £16.19 (free p&p) from the Independent Bookshop: 08430 600 030

LOAD-DATE: April 17, 2012

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newspaper

JOURNAL-CODE: IA

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The Guardian (London) - Final Edition

March 31, 2012 Saturday

Review: CRITICAL EYE: Luck, digital roots and quiet power

SECTION: GUARDIAN REVIEW PAGES; Pg. 15

LENGTH: 600 words

Ed Smith, the author of Luck: What It Means and Why It Matters, is "an improbably handsome man", the Sunday Times's Dominic Lawson enthused, "a former England cricket international who has a first-class degree from Cambridge. To (which) the normal male reaction is 'lucky bastard!'" Smith has also enjoyed good fortune in most papers at the hands of his reviewers, whose verdicts ranged from the almost unqualified admiration of Lawson ("like one of Smith's well-crafted innings in his playing career, it leaves you wanting more") and the Mail's Marcus Berkmann ("cogently argued . . . wholly pleasing") to thumbs-ups with mild criticisms: the New Statesman's Peter Wilby felt Luck "could have been more rigorous" but said, "you'll probably read the book in an evening but think about it for weeks, even years afterwards"; while in the Financial Times, Simon Kuper wrote that "occasionally the ideas are light (and) sometimes the book is merely a string of good anecdotes, perfectly told. Yet perhaps that is enough."

In their responses to George Dyson's Turing's Cathedral: The Origins of the Digital Universe, centred on a seminal computer project begun at Princeton in the 1940s, reviewers have managed to end on an upbeat note despite seemingly damning reservations. The Daily Telegraph's **Manjit Kumar,** for example, concluded by praising Dyson for "reminding us how much we owe" to the pioneers it portrays; yet he had pointed out that the title is markedly misleading - Alan Turing plays only a secondary role, and "Dyson's book is about Von Neumann", who organised the building of the computer. The contrast between eventual judgment and earlier caveats was even more pronounced in the Observer's review by Evgeny Morozov. "Turing's Cathedral is an engrossing and well-researched book that recounts an important chapter in the convoluted history of 20th-century computing," Morozov sunnily summed up, after previously conceding such "shortcomings" as the way the author "bombards the reader with a mind-boggling stream of distracting information that adds little to his tale", and "a slew of untenable generalisations" when he tries "to connect Von Neumann's cold war computing to today's Silicon Valley".

Just as near-unanimously as they decided Smith's and Dyson's books should be assessed by men, literary editors resolved Susan Cain's Quiet: The Power of Introverts in a World That Can't Stop Talking could best be appraised by female reviewers. The Observer went for two, identified as an introvert and an extrovert. Sara Maitland, the former, called its thesis of extrovert hegemony "silly" and found it perversely "a remarkably noisy 'extroverted' book, bombarding the reader with a massive range of unharmonious 'facts' and psychobabble . . . Lovers of quiet won't like Quiet - we would rather go for a nice walk in the country." Extrovert Miranda Sawyer was unimpressed too, saying the book's "grating" eagerness to divide people into two categories made it "little more than another Men Are From Mars, Women Are From Venus tick-box work". Judith Warner concurred in the New York Times, condemning "a long and ploddingly earnest book" and the author's widening of the definition of introversion ("basically, all that is wise and good") so the term became "meaningless". Support for Cain came only from the Sunday Times's Daisy Goodwin: "The mixture of journalism, science-lite and self-help is not always satisfying, (but) Cain's central thesis is fresh and important".

Captions:

'Engrossing and well-researched' . . . George Dyson's Turing's Cathedral: The Origins of the Digital Universe

LOAD-DATE: March 31, 2012

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newspaper

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Wall Street Journal Abstracts

March 28, 2012 Wednesday

ECHOES OF THE BIG BANG

BYLINE: **MANJIT KUMAR**

SECTION: A; Pg. 11

LENGTH: 14 words

ABSTRACT

Manjit Kumar Bookshelf column reviews Chris Impey's book, How It Began; photo

LOAD-DATE: March 29, 2012

LANGUAGE: ENGLISH

GRAPHIC: Photograph

DOCUMENT-TYPE: Review

PUBLICATION-TYPE: Newspaper

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The Telegraph
telegraph.co.uk

March 27, 2012 Tuesday 11:26 AM GMT

Turing's Cathedral by George Dyson: review; Manjit Kumar reviews Turing's Cathedral by George Dyson, which explores the creation of one of the first computers.

BYLINE: By **Manjit Kumar**

LENGTH: 732 words

"Princeton is a madhouse," wrote Robert Oppenheimer in January 1935. Twelve years later, after directing the building of the atom bomb, he would return to the Institute for Advanced Study (IAS) to take charge of this "madhouse".

One of the permanent residents was Einstein. Another of Oppenheimer's new charges was a former colleague from the Manhattan Project who was now "thinking about something much more important than bombs".

The Hungarian-born polymath John von Neumann would make seminal contributions to everything from quantum mechanics to game theory, and had turned his prodigious talent to "thinking about computers".

On November 12 1945, he gathered together six people and started the IAS's Electronic Computer Project to design and construct a programmable electronic digital computer. After five years the Mathematical and Numerical Integrator and Computer (Maniac) was fully functioning but it had only five kilobytes of storage, less memory than is used to display a single icon on your computer screen.

The rest may be history but it's one George Dyson is uniquely qualified to capture in Turing's Cathedral. The son of the distinguished physicist Freeman Dyson, he grew up in the environs of the IAS where his father has been a member since 1948. Dyson used his privileged position to gain access to people and to explore archives untouched for decades. The years of research and writing have enabled him to bring to life a myriad cast of extraordinary characters each of whom contributed to ushering in today's digital age.

While our universe may have popped out of nothing due to what physicists describe as a quantum fluctuation, the origins of the digital universe of 0s and 1s required the US military's desire to be armed with a hydrogen bomb at the beginning of the Cold War and it "had to be squeezed into existence" between simulations of nuclear explosions. Two real-world explosions in 1952 and 1954 confirmed the correctness of those calculations and the indispensable nature of a computer that could be reprogrammed to carry out different tasks, the theory behind which had first been worked out by the British mathematician Alan Turing.

Despite its title, Turing doesn't make his much anticipated entrance in Dyson's book until chapter 13, when as a 24-year-old he boards a transatlantic liner bound for New York in September 1936. Turing was to spend the next two years in Princeton working on his PhD, but before leaving Britain he had already finished his seminal paper "On computable numbers". It would, as Dyson points out, "lead the way from logic to machines" as Von Neumann's team turned Turing's theoretical ideas into Maniac.

Turing may have been the intellectual visionary, but Dyson's book is about Von Neumann, the chief architect who oversaw the construction of the hardware and software architecture that allowed sequences of code to be stored, recalled and executed. Yet Dyson acknowledges that Maniac was not the first operational stored-programme computer. That was the Small Scale Experimental Machine, developed in June 1948 at Manchester University where Turing was by then based having helped break the German navy's Enigma code during the war as a leading member of Bletchley Park.

Turing and Von Neumann were chalk and cheese in everything except their shared interest in computers. Von Neumann always dressed in a suit and spoke with precision; Turing was unkempt and hesitated as if

words could not keep up with his thoughts. Von Neumann had an eye for women; Turing's homosexuality would lead to a conviction for gross indecency. Forced to undergo "therapy" with oestrogen injections, he committed suicide in 1954.

Faced with the tricky task of balancing technical details with keeping the narrative accessible for the non-computer buff, Dyson ends up probably not giving enough detail to satisfy the aficionado but too much for the lay reader. "Evolution in the digital universe now drives evolution in our universe," he says, "rather than the other way around."

Turing, Von Neumann and their colleagues may have let the genie out of the bottle, but Dyson has done the difficult job of reminding us of how much we owe them and how far we have come in such a short time.

* **Manjit Kumar** is the author of Quantum (Icon)

Turing's Cathedral

by George Dyson

401pp, Allen Lane t £23 (PLUS £1.25 p&p) Buy now from Telegraph Books (RRP £25)

LOAD-DATE: March 28, 2012

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Web Publication

JOURNAL-CODE: WEBDTNS

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The Telegraph
telegraph.co.uk

March 26, 2012 Monday 4:06 PM GMT

Seeking a place in the cosmos;
About Time: from Sun Dials to Quantum Clocks - How the Cosmos Shapes Our Lives, by Adam Frank, 432pp, Oneworld, £12.99 432pp

BYLINE: By **Manjit Kumar**

LENGTH: 632 words

ST AUGUSTINE, the fifth-century theologian and Church father, famously discussed the nature of time in Book XI of his Confessions: "What is by now evident and clear is that neither future nor past exists, and it is inexact language to speak of three times - past, present and future. Perhaps it would be exact to say: there are three times, a present of things past, a present of things present, a present of things to come." For centuries it was a description as good as any.

Today there are many books on the nature of time as we experience it and even more on cosmic time as revealed by science. Yet few attempt to recount the entwined narratives of cosmic history and human time as a unified whole. Adam Frank's About Time does just that. An astrophysicist at the University of Rochester, he and many of his colleagues believe that "the Big Bang is all but dead".

Frank and the others do not doubt the scientific narrative of cosmic evolution over the last 13.7 billion years, only the "bang" in Big Bang. The moment of creation with no before is being questioned because of the very precision of the science that gave the notion "a measure of reality in the first place". "The roots of cosmology cannot be reworked without a new conception of time, including its origins and its physical nature," argues Frank in this excellent book.

Cultures have always needed a cosmology to understand their place in the framework of creation. Frank shows how, as our ideas about cosmology and cosmic time have changed, human time has also changed. Acknowledging that the broad sweep of history, science and time which follows focuses primarily on the cultural development of the West, for Frank the most potent and obvious example of the binding of human and cosmic time is the industrial revolution with its roots in the scientific discoveries of Newton and its radical reformation of everyday life.

The first intimation of the modern structured day was born in the medieval monasteries. From sunrise to sunrise, the monks followed the horae canonicae, the rounds of worship beginning from sunrise (matins) through midday (sext) and sunset (compline) and through the night to matins again.

Yet the division of the day into 24 hours was invented by Babylonian astronomers, but it did not gain widespread acceptance until the advent of mechanical clocks in the 14th century. No one knows who invented the clock and in particular its key component - the escapement, the notched rings that allow gravitational energy stored in a hanging weight to be regulated and released. By the end of the 15th century, the town clock was a matter of civic need and pride. Soon the ancients' Earth-centred universe gave way to Copernicus's sun-centred cosmos and then to Newton's clockwork universe, with space and time as absolute, unchanging and eternal.

Throughout the 18th century the new universal laws of physics reworked human conceptions of the heavens and before long led to machines that paved the way to industrialisation. And today we describe times in a digital format - for example, 1.17pm. "It's a new time that we have created in our hyperdigital, telepresent, instant-messaged society," says Frank.

After 50 years of trying, physicists still lack a theory of quantum gravity - "a theory of space and time on scales so small entire universes could be bound in an atom". Consequently cosmology, and our understanding of time, remains incomplete and full of speculation. Is the universe one in a long line? Could there be many bangs going off all the time, creating simultaneously existing universes - a multiverse?

These ideas might sound like science fiction but they are being pursued by some theorists, while others, reports Frank, hope for "something else, something better, something not yet imagined".

LOAD-DATE: March 28, 2012

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Web Publication

JOURNAL-CODE: WEBDTNS

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The Daily Telegraph

The Daily Telegraph (London)

March 24, 2012 Saturday
Edition 1;
National Edition

Books

SECTION: REVIEW;FEATURES; Pg. 25

LENGTH: 30 words

Manjit Kumar on Alan Turing 26

John Preston on good neighbours 27

Tim Martin on Nathan Englander 29

Helen Brown on elephant-lovers 30

Plus

Lorna Bradbury on books to get kids giggling 37

LOAD-DATE: March 24, 2012

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newspaper

JOURNAL-CODE: DTL

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Derby Evening Telegraph

February 20, 2012 Monday
Edition 1;
National Edition

Councillors joined in with the celebrations [...]

SECTION: NEWS; Pg. 8

LENGTH: 1 words

LOAD-DATE: February 20, 2012

LANGUAGE: ENGLISH

GRAPHIC: Councillors joined in with the celebrations yesterday to mark the 635th birthday of mystic Shri Guru Ravidass Ji. Pictured at the Guru Ravidass Temple at Duncan Road, Derby, from left, are Councillor Ajit Atwal, Sucha Singh Atwal, the president of the Supreme Council of Sikhs, Derby Mayor Councillor Les Allen, Councillor **Manjit Kumar** Chahal and Councillor Joe Naitta. Picture: Alex Cantrill-Jones DEACJ20120219A-017_C
Picture: Alex Cantrill-Jones DEACJ20120219A-017_C

PUBLICATION-TYPE: Newspaper

JOURNAL-CODE: DET

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THE TIMES

thetimes.co.uk

January 25, 2012 Wednesday 12:01 AM GMT

10 ways to enrich your child's science education; How to get the best out of your child from 11 to 16. The teachers at

Westminster School give you their point-by-point plan

SECTION: FREE PRIVATE EDUCATION

LENGTH: 2586 words

How we teach science by Dr Stephen Spurr, Head Master of Westminster School

Science at Westminster goes well beyond the examined syllabus. There are lectures in the early evenings when pupils are exposed to exciting world-class research, pupil-led scientific societies at lunchtime, extended projects, a scientific magazine written by and for pupils, expeditions (most recently to CERN) and participation in national and international competitions.

This broader scientific curriculum, accessible to pupils of all ages, engenders real engagement with the discipline for those intending to specialise in the discipline at A level and beyond and, just as importantly, helps to ensure scientific literacy and understanding for everyone.

Although science is taught by specialists through the traditional subjects of biology, chemistry and physics, pupils are shown how the sciences are increasingly used together - biochemistry or biophysics for example - or infused with mathematics and ICT, as in bioinformatics.

For similar reasons, the related subjects of electronics and product design are taught in the same building with the three sciences. Alongside the core school curriculum, pupils can also opt for GCSEs in astronomy and psychology, extending their scientific understanding in line with their own and their teachers' enthusiasms. When faced with the introduction of new science GCSEs some four years ago, we chose IGCSEs instead. We found that the GCSE syllabus involved too much emphasis on discussion about science and too little on acquisition of essential scientific knowledge in the attempt to motivate the learner through easier syllabus content.

We believe instead that complex material cannot be avoided if young people are going to become scientifically literate and that it is up to the subjects' specialist teachers to make that scientific knowledge exciting for pupils and relevant to their experience of the world around them.

The Westminster Science Department's guide to learning science

1 Bring science books and magazines into the home

It is vital that a child's natural curiosity should be nurtured and not stifled at a time when it is strongest. This is where the provision of opportunity is important. At last, some exam-board specifications are recognising that rigour is a good thing; children respond well to challenges and understanding is crisper and deeper following hard and focused thought. Skills such as internet research, report writing and giving a presentation have become assessed parts of some courses at both GCSE and post-16. Children should be strongly encouraged to engage with real and exciting science. Science clubs and societies offer the very enriching chance to meet like-minded individuals who share an enthusiasm and interest . There is now a national organisation, STEMNET, that aims to get a science club into every secondary school in the country (see the panel on the right for details).

2 Start your own research project

Having ownership over your own scientific research is one of the ways in which many pupils at school are motivated towards science at university. The phrase "I remember cutting up worms as a child" litters UCAS personal statements for good reason.

Once pupils take a break from jumping through the coursework hoops devised by exam boards and concentrate instead on investigating a problem that no one (not even the experts) knows the answer to, with

no guarantee that their hunch will be supported by evidence, we find that motivation rockets.

Doing an experiment that has been tweaked by teachers and technicians to produce the correct result in a 30-minute lesson is not the same as needing to design a protocol from scratch and realising too late that you've "wasted" a week of lessons building something that won't ever work.

Such research projects don't have to involve sophisticated equipment or expensive materials; in biology, the most successful have used Heath-Robinson contraptions of string and cardboard and a tub of earthworms or ants from the park. How could you investigate if earthworms are social animals? Would they rather be with others than alone? What decisions do ants make when foraging for food; will they go further for a tastier snack?

The starting point for many of our projects is when a pupil has enjoyed reading about some research in a newspaper and has e-mailed the university department that published the work to ask how they could try their own slant on the study. The researchers have always been willing to e-mail back with some recommendations for first steps and many have stayed in touch as the project continues. If you need ideas for what to investigate, or want to help contribute to a larger body of research, then most local wildlife trusts will give an enthusiastic welcome to volunteers willing to help with conservation projects.

Above all, when students conduct their own research projects they acquire the essential habit of learning from failure. Westminster has started a chemistry club in which pupils develop demonstrations of their choice under the supervision of a teacher. They are given broad instructions, but are alone responsible for optimising and developing their work.

Pupils are naturally reluctant to try things out if they think it might not work the first time and our aim is to get them out of this habit. There is room for creativity and originality in science, even at this level, and it is important that pupils are encouraged in this way as it is probably the most important transferable skill they can take into research science.

3 Enjoy the competition

Longer-term project work, either as an after-school club or through a local society, can also be a vehicle for entering competitions in disciplines ranging from nuts-and-bolts engineering projects to theoretical essay competitions. Anyone can enter the National Science and Engineering Competition. For details go to regional.thebigbangfair.co.uk.

Others include: the Cambridge Chemistry Challenge (c3l6.com); the Bill Bryson Prize for science communication (rsc.org) and the Royal College of Science Union Prize (rcsu.org.uk)

4 Take your child and a friend to a museum

When it comes to developing thinking skills, young people learn more from their peers than from adults. Taking them on trips to local museums is a great way to enthuse your child about scientific discovery, but the experience will be more memorable if you ask them to bring along a like-minded friend to help trigger discussion. If the museum disappoints don't be afraid to ask them to evaluate their experience: can they articulate why were they bored? How would they design the exhibition to have a better time?

5 Bring science books and magazines into the home

As the market for popular science books has increased, so too has the quality. Authors whose work our pupils have particularly enjoyed are Jared Diamond, Nick Lane, Matt Ridley, Susan Greenfield, Jim Al-Khalili, John Gribbin and **Manjit Kumar.** It's always reassuring when a pupil tackles The Selfish Gene and realises that Richard Dawkins is not just an angry man shouting at a bishop on TV, but an extraordinary communicator of evolutionary biology. You can also read the latest copy of New Scientist in your local library, although some online subscriptions services (e.g. student-subscription-service.co.uk) offer good discounts to magazines for students.

6 Introduce your child to science lectures

Developing the stamina to sit through a lecture is tough for adults, let alone young people. But being able to concentrate on a speaker's presentation for an hour is an important skill to develop for higher education. Many academic institutions put their public lectures online. A great place to start is the Royal Institution Channel (richannel. org) or the TED talks (ted.com). There are also lots of free public lectures; see your local university for details. There will be lots of events during National Science Week (9-18 March 2012; britishscienceassociation.org).

7 Learn how to ask questions

Learning is about finding out new things and you're only going to be able to do this if you can ask the right questions. Developing your own questions is as important as being able to answer other people's. If you have been watching a lecture with your child, live or online, ask them to think of questions they might want to ask the speaker.

It's intimidating to do this in real life, but it becomes less so if you're in the habit of thinking about what you would want to ask to increase your understanding. The game 20 questions is a great learning tool, but not as good as "five questions"; how close can you get to an answer when you think about the best question to ask?

8 Make things harder, not easier

Some aspects of the subject can appear boring at first and it is easy to cover some of the syllabus in trivial detail, to get through it painlessly. However, pupils are often genuinely fascinated by taking things to first principles and it is important not to gloss over any of the intellectually demanding aspects of the subject. If your child seems bored by what he or she is studying, make things more demanding - look for a book or online lecture that goes deeper into the subject, make it feel as if they are engaging with a difficult intellectual concept, not another chunk of the syllabus. There is no getting away from the fact that science is hard, and rather than dumbing it down to try to make it easier, highlight the challenges and encourage your child to give it a go.

9 The Attenborough Effect: natural history comes home

The BBC's natural history programming is, of course, extraordinary. Clips from the latest Frozen Planet series are going to be scattered through our lessons for years. Watch such programmes with your child but once it is over don't switch to another programme - ask them to explain why a particular unusual behaviour might be advantageous to the animal. The same evolutionary forces that have changed the size and arrangement of bones and teeth have sculpted behaviour; it must ultimately result in more of the organism's genetic material being passed down to following generations. Playing the evolutionary problem-solving game is an easy way of forcing your brain to think between straightforward and macroevolutionary explanations.

10 Join a science club and do some original research

Once students reach the sixth form, they may be fortunate to be in a science club that undertakes original work. What about trying to get this work into print? By researching publications students begin to engage with the world of university science. In Years 12 and 13 we have an extracurricular chemistry research group. Much of the department's work has been published in educational magazines and journals Dr Kevin Walsh, Head of Science and a physicist, Mr Sam Baldock, Head of Biology and Dr Richard Kowenicki, Head of Chemistry

How to join a science summer school

If your child is keen on science (or if they need a confidence boost), you may want to consider some of the outreach programmes run by independent schools. These can be a way to supplement what's being taught in school and explore subjects beyond the main curriculum.

Westminster runs a summer school for Year 11 pupils from state schools across London, largely funded by

the educational trust Shine. This year, we will be linking with King's College London and Imperial College London to further strengthen the follow-up programme. In the sciences, we aim to develop understanding by carrying out a major practical assignment that is not routinely available in state schools.

In biology, for example, rat dissections are a luxury that state schools often can't afford. Although diagrams in text books can go a long way towards explaining how organ systems function, it's only through dissections that you can really appreciate the interconnections and complexity. "At first, having opened up the rat's abdomen, pupils are usually disgusted, confused and daunted in equal measures," says Josh Moore, a biology teacher at Westminster. "But it doesn't take long for them to recognise organs that they have studied. This gives a great sense of achievement."

These summer school alumni are then invited back to a series of science lectures devised in partnership with Imperial College London. Delivered by leaders in their field, they are intended to provide a window into academic opportunities available to the pupils after they leave school. For 7 to 11-year-olds, Westminster also organises a series of interactive science workshops. Classes of local primary children are invited to these events, which are devised by members of the Westminster science staff as a way to enthuse young pupils in practical science, medicine and technology.

For details go to westminster.org.uk/ bout-us/westminster-in-the-community

Jeremy Kemball, Senior Tutor, Westminster School

The best science clubs and competitions

Here are some great ways to consolidate school science:

· STEMNET (Science, Technology, Engineering and Mathematics Network) aims to run clubs and workshops in all UK schools (stemnet.org.uk).

· The Royal Institution runs the L'Oréal Young Scientist Centre, a modern lab where 7 to 18 year-olds can try cosmetic and colour chemistry and analyse DNA (rigb.org).

· The National Science and Engineering Competition is open to all 11 to 18 year-olds living in the UK and in full-time education, rewarding excellence in STEM projects. The finals are held at the Big Bang Fair.

This free event at Birmingham NEC for 9 to 18 year-olds gives students the chance to try experiments and meet scientists. (thebigbangfair.co.uk).

· The Cambridge Chemistry Challenge is an online-only monthly competition open to anyone (no teachers necessary). In June there is also a written exam for British year 12 students (c3l6.com).

· The RSC Bill Bryson Prize for science communication is open to students aged 5 to 18 who enter science work in all forms including puzzles and videos. The best primary and secondary entries receive £500 for their institution and £100 for the winning students to share (rsc.org/education/ billbryson).

· Judges for the Royal College of Science Union Challenge include Lord Winston. The prize includes a tour of CERN and the House of Lords. School students answer one or four questions set by scientists (rcsu.org.uk/science challenge/index.php).

· CREST is the nationwide curriculum-enrichment award scheme, run by the British Science Association: 11 to 19 year-old students work on science projects recognised by UCAS. (britishscienceassociation. org/crest).

· Check what's on at your local science museum. Manchester Museum of Science and Industry (www.mosi.org.uk), Lifelab at the Newcastle Life Centre and the London Science Museum have a calendar of educational workshops.

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Hindustan Times

November 16, 2011 Wednesday

MAN HELD AT AIRPORT WITH AMMUNITION

LENGTH: 91 words

DATELINE: PATNA

PATNA, Nov. 16 -- Security went into tizzy at the Patna airport minutes before the scheduled departure of former president APJ Abdul Kalam when a passenger-travelling by the same GoAir flight to New Delhi-was found carrying five live bullets and a magazine in his baggage. The passenger, identified as **Manjit Kumar** from Supaul, has been detained. Published by HT Syndication with permission from Hindustan Times. For any query with respect to this article or any other content requirement, please contact Editor at htsyndication@hindustantimes.com

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Arts & Book Review

November 4, 2011
First Edition

Beauty spots in the book of nature; THE ART OF SCIENCE: A NATURAL HISTORY OF IDEAS by Richard Hamblyn Picador, £20, 485pp £18 from the Independent Bookshop: 08430 600 030

BYLINE: Manjit Kumar

SECTION: BOOKS; Pg. 20

LENGTH: 680 words

The equation ig.dy = my is a thing of beauty. It's the inscription carved on the memorial stone in Westminster Abbey commemorating the life and work of the greatest British physicist of the 20th century, Paul Dirac. By accounting for the spin of the electron, Dirac's equation managed to reconcile Einstein's special theory of relativity with one of the few genuine revolutions in human thought, quantum mechanics. Does it matter, asks Richard Hamblyn, that Dirac's equation remains a closed book to all but a handful of initiates able to translate its compact hieroglyphics into a statement about the nature of the universe?

For Hamblyn, it does. Few of us can read ancient Aramaic or have ever finished Finnegans Wake; nevertheless we manage to struggle along just fine. So why is Dirac's equation, and other such mathematical statements, different? Hamblyn worries that while an inability to read an ancient language or an experimental novel rarely leads to a wholesale rejection of all other languages or literature, there is a tendency among non-scientists to characterise the whole of science as being as reductive, difficult and as alien as Dirac's equation.

Introducing this anthology, Hamblyn overstates the case to reinforce his point, especially when the likes of Brian Cox and Alice Roberts make science on TV accessible to all. Intellectual engagement and entertainment are the key ingredients as scientists try to connect with audiences beyond the lab and lecture theatre. Hamblyn achieves that in this collection, as he showcases not only readable translations of key scientific ideas but situates those ideas in their cultural and historical context.

The hundred-odd pieces selected either reflect the situation in which a moment of scientific understanding took place or reveal the personalities of the scientists involved. The extract from James Watson's account of the events leading up to the discovery of the structure of DNA, for example, highlights the egotism and insensitivity to be found on virtually every page of The Double Helix - yet these character traits were important factors in Watson's scientific success.

Among the classics Hamblyn has chosen is Tycho Brahe on the supernova, William Harvey on the circulation of blood, Galileo on the moons of Jupiter, Einstein on the quantum theory of light, Fahrenheit on his temperature scale and Darwin on the Origin of Species. However, the strength of the collection lies in the surprises from among the contributions made by amateurs: Seneca on whirlwinds; the schoolteacher and champion of atomism John Dalton on colour blindness; the classification of clouds into cirrus, cumulus, and stratus that remains in use today by the pharmacist Luke Howard; the account by the country doctor Gideon Mantell of how he reconstructed the Iguanodon from its fossilised teeth, and - my favourite - a piece on snowflakes by Vermont farmer Wilson Bentley.

With the ingenious aid of a bellows camera rigged up to a microscope, in 1885 Bentley became the first person successfully to photograph snowflakes. Over the next 40 years, having built up thousands of images, Bentley concluded that no two snowflakes are the same. His life's work was "one of the little romances of science". Although there are other such romances, Hamblyn has largely chosen pieces that have

documentary value.

James Lind's account of his clinical trials on board HMS Salisbury affords us a surgeon's-eye view of everyday life on an 18th-century warship complete with barrels of baked biscuits and a scurvy-ridden crew. We get a glimpse of the reaction to Copernicus's new ordering of the cosmos through contemporary accounts that also shed light on the means by which his ideas began to spread.

"Art is the Tree of Life," wrote William Blake. "Science is the Tree of Death." This collection proves such accusations to be groundless as it offers ample evidence, to be dipped into at leisure, for what Hamblyn describes as the greatest invention of the human imagination, "the art of scientific thinking".

Manjit Kumar's 'Quantum' is published by Icon

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The Telegraph
telegraph.co.uk

October 24, 2011 Monday 11:37 AM GMT

The Quantum Universe: Everything That Can Happen Does Happen by Brian Cox and Jeff Forshaw: review; Manjit Kumar enjoys The Quantum Universe: Everything that Can Happen Does Happen by Brian Cox and Jeff Forshaw.

BYLINE: By **Manjit Kumar**

LENGTH: 829 words

More than 10,000,000,000, 000,000,000 transistors are manufactured each year. For an idea of the magnitude of this number, it is roughly 100 times greater than all the grains of rice consumed annually by the people of planet Earth. This astonishing fact about the fundamental building block of all electronic devices is

buried deep within The Quantum Universe, the latest book from Brian Cox and Jeff Forshaw.

The very first transistor computer built in 1953 had just 92 transistors, but today more than 100,000 can be bought for the cost of a single grain of rice and there are around a billion of them in a mobile phone. It is easy to see why Cox and Forshaw believe the invention of this device was "the most important application of quantum theory", while the theory itself is "the prime example of the infinitely esoteric becoming the profoundly useful".

It is esoteric because the theory describes a reality in which a particle can be in several places at once and moves from one place to another by exploring the entire universe simultaneously. The American physicist Richard Feynman unveiled a piece on the quantum universe, but nevertheless cautioned: "I think I can safely say that nobody understands quantum mechanics. Do not keep asking yourself, if you can possibly avoid it, 'But how can it be like that?' Nobody knows how it can be like that."

Heeding this advice and sticking to the maxim that "following the rules is far simpler than trying to visualise what they actually mean", Cox and Forshaw set out to "demystify quantum theory". If they do not entirely succeed, it says more about the size of the task they have set themselves than its execution. The word "quantum", they warn at the outset, is at "once evocative, bewildering and fascinating". Having written a narrative history myself with that one word as a title, I know exactly what they mean.

Peppered with diagrams and equations, The Quantum Universe is not an easy read. We encounter Planck's constant (nature's own axe for chopping up energy and much else besides); the principle of least action; the wave function; the uncertainty principle; electron standing waves; the exclusion principle; semiconductors; Feynman diagrams; quantum electrodynamics; the Higgs boson and the standard model of particle physics. The reader is made to work along the way and for those prepared to do so there is much to learn. Why, for example, empty space isn't empty but is a seething maelstrom of subatomic particles.

While they sidestep the question of its interpretation and the decades-long debate between Albert Einstein, Niels Bohr and others, for Cox and Forshaw there is no better demonstration of the power of the scientific method than quantum mechanics. Nobody could have come up with the theory without the aid of detailed experiments, and the physicists who came up with it were forced to suspend and then discard their previously held beliefs to explain the evidence that confronted them. In an attempt to convince any sceptical readers about the power of quantum mechanics, the authors turn to the death of stars and the Chandrasekhar limit as they champion curiosity-driven research.

The sun is a gaseous mix of protons, neutrons, electrons and photons with the volume of a million earths that is slowly collapsing under its own gravity. This compression heats the core to such temperatures that protons fuse together to form helium nuclei. The fusion process releases energy that increases the pressure on the outer layers of the star, thus balancing the inward pull of gravity. And so it will go on for the next five billion years until the sun runs out of material to fuse and ends up as a super dense ball of nuclear matter in a sea of electrons known as a white dwarf. It's a fate that will befall more than 95 per cent of the stars in our galaxy. Though the highlight of the book is confined to the epilogue, Cox and Forshaw show how it's possible to approximately calculate the largest possible mass of these stars.

The detailed and more complex calculation was originally published in 1931 by the Indian astrophysicist, and future Nobel laureate, Subrahmanyan Chandrasekhar. It led to two remarkable predictions: white dwarf stars exist and they cannot have a mass greater than 1.4 times that of the sun. Astronomers have catalogued some 10,000 white dwarves and the largest recorded mass is just under 1.4 solar masses. Depending on four of nature's fundamental numbers - Planck's constant, the speed of light, Newton's gravitational constant and the mass of the proton - Chandrasekhar's limit is a stunning triumph of the scientific method. "The eternal mystery of the world is its comprehensibility," Einstein wrote. "The fact that it is comprehensible is a miracle."

* Quantum by **Manjit Kumar** is published by Icon

The Quantum Universe: Everything That Can Happen Does Happen by Brian Cox and Jeff Forshaw

272pp, Allen Lane t £18

(PLUS £1.25 p&p) from Telegraph Books (RRP £20, ebook £9.99)

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The Daily Telegraph
The Daily Telegraph (London)

October 22, 2011 Saturday
Edition 1;
National Edition

Justine Picardie on Coco Chanel [...]

SECTION: REVIEW;FEATURES; Pg. 25

LENGTH: 22 words

Justine Picardie on Coco Chanel 26

Manjit Kumar on Quantum leaps 26

Frances Wilson on Charles Dickens 28

Philip Hensher on JG Ballard 20

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PUBLICATION-TYPE: Newspaper

JOURNAL-CODE: DTL

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The Daily Telegraph
The Daily Telegraph (London)

October 22, 2011 Saturday
Edition 1;
National Edition

When the esoteric becomes useful

BYLINE: **Manjit Kumar**

SECTION: REVIEW;FEATURES; Pg. 26

LENGTH: 842 words

The Quantum Universe: Everything That Can Happen Does Happen

by Brian Cox and Jeff Forshaw

272PP, ALLEN LANE ¦ £18 (PLUS £1.25 P&P) 0844 871 1515 (RRP £20, EBOOK £9.99) ****

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Manjit Kumar

Quantum by **Manjit Kumar** is published by Icon

Empty space isn't empty, but is a seething maelstrom of subatomic particles

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Arts & Book Review

September 16, 2011
First Edition

Unlocking ancient energy; book of the week KNOCKING ON HEAVEN'S DOOR by Lisa Randall Bodley Head, £20, 442pp £18 from the Independent Bookshop: 08430 600 030

BYLINE: Review by **MANJIT KUMAR**

SECTION: BOOKS; Pg. 22

LENGTH: 1220 words

Why do things weigh what they do? It seems like a simple enough question, but physicists don't know for sure why particles weigh anything at all. For the best part of 50 years they have had an answer - the Higgs boson. It plays such a fundamental role in nature that its been dubbed the "God Particle".

Attempting to answer the question of how the universe got its mass means searching for the Higgs boson. It's a nine billion-dollar enterprise involving thousands of scientists and the largest, most complex machine ever built. The Large Hadron Collider (LHC) contains an enormous 26.6km circular tunnel that stretches between the Jura Mountains and Lake Geneva across the French-Swiss border. Electric fields inside accelerate two beams of protons as they go around 11,000 times per second.

In this fascinating book, Lisa Randall, professor of theoretical physics at Harvard, explains the experimental research at the LHC and the theories that try to anticipate what they will find: "The goal... is to probe the structure of matter at distances never before measured and at energies higher than have ever been explored."

These energies should generate an array of exotic fundamental particles and reveal interactions that occurred early in the universe's evolution, roughly a trillionth of a second after the Big Bang, 13.75 billion years ago. In the debris of colliding protons, physicists hope to find the Higgs boson and get a glimpse at the nature of dark energy and dark matter that make up 96 percent of the universe.

It was 1964 when Peter Higgs conceived of an invisible field that filled the cosmos immediately after the Big Bang. As the newborn universe expanded and cooled, the field switched on. At that moment massless particles that had been travelling at the speed of light were caught in the field and became massive. The more strongly they felt the effects of the field, the more massive they became. Without this field atoms, molecules, galaxies, stars and the planets would not exist.

The Higgs field is like a field of snow that stretches forever in all directions. Beams of light move as though they have skis on: they zip through the field as if it weren't there. Some particles have snowshoes while others go barefoot and trudge around. A particle's mass is simply a measure of how much it gets bogged down in the field.

The ripples in the Higgs field appear as particles called Higgs bosons - the snowflakes that make up the

cosmic snowfield, and the thing that physicists need in order to explain why stuff weighs anything. The Higgs mechanism tells how elementary particles go from having zero mass in the absence of the Higgs field to having the masses measured in experiments. The Higgs boson is a crucial part of what's called the Standard Model of particle physics. It's a construction made out of 24 fundamental building-blocks of matter: 18 of these particles are six types of quarks that come in three varieties. The remaining six are called "leptons", a family that includes electrons.

There are also other particles known as "bosons", responsible for transmitting forces of nature. The electromagnetic force is carried by photons - the particles of light. Inside atomic nuclei, quarks are stuck together by the strong force carried by "gluons". The W and Z bosons carry the weak force that is responsible for radioactive decay. "With these ingredients," explains Randall, "physicists have been able to successfully predict the results of all particle physics experiments to date."

On 10 September 2008, the world's media gathered near Geneva at CERN, home of the European Centre for Particle Physics, to watch the LHC being switched on. "People followed the trajectory of two spots of light on a computer screen with unbelievable excitement," recalls Randall.

In the months to follow, the LHC was to be cranked up to energies that would replicate those of the early universe, but nine days later euphoria transformed into despair as a malfunction triggered an emergency shutdown. After a year-long delay and repairs costing $40m, the LHC came back online in November 2009.

Yet there are other, even bigger, problems in particle physics that the LHC should help to solve. One is the hierarchy problem. The Higgs mechanism addresses the question of why fundamental particles have mass. The hierarchy problem asks the question, why those masses are what they are.

Another concerns hints about the "holy grail of physics", the so-called "theory of everything". The best candidate for such a theory is superstrings, in which particles are really little oscillating bits of "string". The different levels of "vibration" of these strings correspond to the different particles. Alas, it was later found that there were at least five different string theories. Physicists were relieved when it was discovered they were all just different approximations to a more fundamental theory called M-theory. However, the theory poses enormous conceptual and mathematical challenges.

The "super" in superstrings refers to something called supersymmetry. The LHC will be used to look for "supersymmetric particles". If found, they would provide the first tangible evidence in support of superstrings and M-theory. The proponents of superstrings and M-theory justify their creation by pointing to its elegance and beauty.

And there's the problem. The "quest for beauty", which elevates aesthetics over empirical evidence in the formulation of a theory, took centre stage in the more esoteric areas of theoretical physics and cosmology, in the absence of experimental data. An appreciation of beauty certainly has a role to play when faced with a blank piece of paper; an appeal to aesthetic criteria is part of the physicists' unshakeable belief in the underlying simplicity and beauty of nature. It is one of their most powerful guiding principles. Nature should not be more complicated than it has to be, they tell themselves.

It is this belief that motivates the search for a "theory of everything". Randall quotes Keats: "Beauty is truth, truth beauty". It can't be denied that "the search for beauty - or at least simplicity - had also led to truth".

Yet she finds the assumption "a little slippery" and readily admits that "although everyone would love to believe that beauty is at the heart of great scientific theories, and that the truth will always be aesthetically satisfying, beauty is at least in part a subjective criterion".

There is nothing wrong with speculation; it is a necessary and vital part of any science, as a first step. The danger of "truth through beauty" in physics, as Randall describes it, is that it makes a virtue of necessity. Wherever experimental evidence can be coaxed out of nature, it suffices to corroborate or refute a theory and serves as the sole arbiter of validity. As Darwin's champion Thomas Huxley once said, "science is organized common sense where many a beautiful theory was killed by an ugly fact".

Despite the delay in the LHC, it will be a source of invaluable new data that will provide stringent constraints on what phenomena or theories beyond the Standard Model can exist. We maybe on the edge of discovery, but for the moment the Higgs boson remains a hypothetical particle on which rests the weight of the universe.

Manjit Kumar's 'Quantum' is published by Icon Books

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THE TIMES
The Times (London)

September 1, 2011 Thursday
Edition 1;
National Edition

The Month

SECTION: EUREKA;FEATURES; Pg. 56,57

LENGTH: 703 words

Spooklights Radio 4 Check listings for exact times What are the explanations for the strange lights known as spooklights or will-o-the-wisp, and can they be recreated in the lab and ield? Survivors by Richard Fortey Sept 1, HarperPress, £25 Professor Fortey is not only a brilliant scientist, but a wonderful writer. His latest book searches for visible traces of evolution in the living creatures that have survived from earlier times.

Live Lab At-Bristol Sept 730, £12.50/£8 Take part in a live experiment: extract your own DNA, see your cells or watch a dissection.

Abandon Normal Devices Locations across the Northwest Sept 1Oct2 The annual festival of "anarchists of the imagination" focuses this year on belief in an era of scepticism. www.andfestival.org.uk A More Perfect Heaven: How Copernicus Revolutionised the Cosmos Royal Institution, London W1 Sept 5, 78pm, £10/£7/£5

Dava Sobel (of Longitude fame) tells the story of astronomy from Aristotle to Copernicus in the Middle Ages.

Scott Polar Research Institute - Heritage Open Day University of Cambridge Sept 9, 11am-Noon, 23pm, 34pm A rare chance to explore the world's premier polar collection, including books that have travelled to both Poles, and the most current research.

The Times Comprehensive Atlas of the World Sept 15, HarperCollins, £150 The essential aid for every traveller, whether intrepid or armchair, now in its 13th edition, with 25,000 updates and 7,000 place name changes.

Quantum Theory Cannot Hurt You Royal Institution, London W1 Sept 15, 78.30pm, £10/£7/£5 Quantum theory and Einstein's general theory of relativity explained by **Manjit Kumar** and Marcus Chown.

Planet Dinosaur BBC One Check listings for exact times A six-part series bringing dinosaurs to life, from the biggest and iercest to the smallest and cutest.

Meanwhile, on BBC Four, there's a three-parter, How to Build a Dinosaur.

Crazy Chemicals The Life Science Centre, Newcastle Sept 13Dec 4, Mon-Sat, 106, Sun 116, £9.95/£6.95 A new 20-minute event showcasing the beauty of chemistry through colourful and dramatic reactions.

British Science Festival Bradford, various locations Sept 1015, free for most attractions; booking required 50 More than 250 events, activities, exhibitions and trips aimed at all ages and levels of interest in science. www.britishscienceassociation.org MathsJam Cities across Britain Sept 20 (and the second last Tuesday of every month), 7pm, free A monthly opportunity for maths fans to get together and share puzzles, enigmas and beautiful theories. www.mathsjam.com World Carfree Day Everywhere! Sept 22 Join motorists around the world by abandoning your car for the day to help to reduce pollution.

www.worldcarfree.net Robots that Care Radio 4 Sept 26, 11am How do scientists begin to build sensitivity into the design of robots? Also today, Radio 4 launches So You Want to be a Scientist? www.bbc.co.uk/radio4/scientist One Culture: the Royal Society Festival of Literature and Arts Royal Society, London SW1 Oct 12, 10am-7pm Science meets art and literature in the RS's irst literary festival, with Paul Nurse and Sebastian Faulks.

Autumnal Equinox Sept 23, 9.04 GMT Day and night are the same length heralding the irst day of autumn.

How to Make a Tellurian Royal Observatory, Greenwich Sept 24, 2, 2.30, 3, 3.30, 4, 4.30pm, free Make a model that shows how day and night result from the tilt and rotation of the Earth. Ages 5+.

Prosperity Through Chemistry Royal Institution, London W1 Sept 30, 89.15pm, £10/£15 Professor David Phillips looks at how chemistry is being used to solve global problems such as new energy sources, food, clean water and healthcare, including his own work in photodynamic cancer therapy.

British Wildlife Photography Awards, Collection 2 Sept 30, AA Publishing, £25 From puffins to fallow deer: a collection of the very best images of Britain's rich wildlife from the 2011 entries to the photography award.

Ford examines the ideas that warring would win the battle.

The Chemical History of a Candle by Michael Faraday/Frank A.J.L. James Sept 22, OUP, £14.99 A special edition of one of the most famous science books to mark the 150th anniversary of its irst publication. It features a facsimile of Faraday's lecture notes.

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PC Magazine.com

August 1, 2011 Monday 5:36 PM EST

Summary Reading: My Favorite Science and Tech Books

BYLINE: Michael J.Miller

SECTION: FORWARD THINKING

LENGTH: 852 words

HIGHLIGHT: For me at least, summer vacation is a great time to catch up on my reading. While a lot of what I read isn't really relevant to PCMag (I love science fiction, for instance), I thought this might be a good opportunity to mention some of the best books I've read this year that touch on science and technology.

For me at least, summer vacation is a great time to catch up on my reading. While a lot of what I read isn't really relevant to PCMag (I love science fiction, for instance), I thought this might be a good opportunity to mention some of the best books I've read this year that touch on science and technology. My guess is that most PCMag readers know the basics of the Apollo program, which culminated with the first manned moon landing on June 20, 1969. But even if you know the basics, *Rocket Men* by Craig Nelson (2009, Penguin) is filled with lots of little details and surprises as it takes you through the history of the U.S. manned space program.

Even though you know how it ends, Nelson's tale of Neil Armstrong and Buzz Aldrin setting down the lunar lander with less than a minute's fuel left is surprisingly suspenseful. Based on recently declassified documents, lots of NASA oral history files, and interviews, Nelson goes behind the scenes to show the political and military goals of the Mercury, Gemini, and Apollo programs, and to really document how the

astronauts worked with each other and with the teams of scientists and engineers who were the unsung heroes of the space age. Nelson talks candidly about the politics and the costs of the Apollo program, including the personal costs on the astronauts. But still it left me a bit nostalgic for the space program. Visiting the National Air & Space Museum in Washington recently, I noted that I never expected that the Apollo 17 mission would be the *last* time we'd see a man on the moon, but it's looking that way. The revolution in quantum mechanics in the early part of the 20th century has been the subject of all sorts of books, but I found *Quantum* by **Manjit Kumar** to be a wonderfully readably portrait of the science--and just as importantly, the scientists--involved. Subtitled "Einstein, Bohr and the great debate over the nature of reality," *Quantum* initially focused in on the fifth Solvay conference on electrons and photons held in Brusels from October 24th to 29th in 1927, which gathered the greatest physics minds in the world to debate the controversial findings they were gathering about the inner workings of the atom. Despite the title, *Quantum* focuses less on Einstein (whose story has of course been told in more detail elsewhere) and more on somewhat lesser known figures. Those featured include: Neils Bohr, the great Danish scientist sometimes called the "pope of quantum mechanics," who came up with much of the current model of the atom; Werner Heisenberg, his German protege, who came up with the uncertainty principle and developed an unusual way for solving quantum equations; and Edwin, Schrodinger who created an easier but equivalent method for solving those equations. Many of these people had great debates about the meaning of quantum dynamics, which in many ways set the stage for arguments that still drive physics today. I've read a number of histories of that period and the scientists involved, but *Quantum* struck me as particularly lucid in its description of both the science and the people behind it. Matt Ridley's *The Rational Optimist* is a refreshing antidote to the dystopian futures you read about in so many articles and books about the problems we face with growing population, shrinking oil supplies, and global warming. While not denying the real problems the world faces, Ridley makes a forceful case for how, in general, living standards have improved--and continue to improve--for the vast majority of people. In particular, he has nothing but scorn for people who write about how things were better in some earlier era, pointing out how when compared with life today, people in the past lived lives that were "nasty, brutish, and short" (in the words of Thomas Hobbes). He points out the tremendous increases in living standards, health care, and free time that humanity has gained in the past 200 years and talks about how just about everyone in the developed world has many more options and choices. He also notes that we have the many more people working for and waiting on us than the French "Sun King" had. Ridley traces this to amazing improvements in productivity and, more specifically, to ever-increasing specialization, which led to a point where just about every product you see is actually the work of many people, with each working on a small segment. His overall argument is compelling. After all, we do generally live better than our parents did. Personally, I worry that such improvements are often far from smooth, and thus I'm more concerned than Ridley seems to be about slowing progress in a number of fields and issues like dwindling natural resources and global warming. And I noticed a couple of factual errors (which I'm told will be corrected in the paperback issue). Still, Ridley makes strong and interesting arguments against the alarmist predictions around population growth, peak oil, and global warming, and the book makes a strong counterpoint to the gloom-and-doom narratives that seem to dominate the popular discussion.

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The New York Times

June 26, 2011 Sunday
Late Edition - Final

Paperback Row

BYLINE: By IHSAN TAYLOR

SECTION: Section BR; Column 0; Book Review Desk; Pg. 36

LENGTH: 522 words

YOUR FACE TOMORROW: Volume Three -- Poison, Shadow and Farewell, by Javier Marias. Translated by Margaret Jull Costa (New Directions, $16.95.) In the final volume of Marias's disquieting novel, his narrator -- hired by MI6 in London as an "expert translator or interpreter of people" -- peers into the territory of torture as he returns home to Madrid to both spy on and protect his own family.

THE EYES OF WILLIE McGEE: A Tragedy of Race, Sex, and Secrets in the Jim Crow South, by Alex Heard (Harper Perennial, $15.99.) In 1945, Willie McGee, a black truck-driver, was accused of raping a white woman in Laurel, Miss. Although many were convinced of his innocence, McGee was sentenced to death by an all-white jury and electrocuted in 1951. Heard examines the trial and its aftermath, which exposed the seething tensions of the early civil rights era.

PRIVATE LIFE, by Jane Smiley (Anchor, $15.95.) Smiley's novel is a panoramic portrait -- from post-Civil War Missouri to California in the midst of World War II -- that traces the life stages of a passive woman, including her sad marriage to a delusional astronomer. " 'Private Life' reflects the pressures of the larger world on the most intimate aspects of personal existence," Sven Birkerts wrote here.

HENRY CLAY: The Essential American, by David S. Heidler and Jeanne T. Heidler (Random House, $18.) As speaker of the House of Representatives, secretary of state, United States senator and perennial contender for the presidency, Henry Clay (1777-1852) pioneered the role of political insider. This thorough biography attributes much of his Congressional success to his congeniality.

THE BLINDNESS OF THE HEART, by Julia Franck. Translated by Anthea Bell (Grove, $15.95.) Franck's first novel to be translated into English opens with a woman abandoning her young son in a German train station in 1945, then reconstructs how her heart was broken in stages amid the decadence of Weimar Berlin.

HITCH-22: A Memoir, by Christopher Hitchens (Twelve, $14.99.) As provocative as Hitchens himself, "Hitch-22" recalls his coming-of-age as a journalist and public intellectual, charting the long arc of his political thinking: from his opposition to war in Vietnam to his support for intervention in Iraq. (In a new preface, Hitchens ruminates on his diagnosis and continuing struggle with cancer.) "He argues ruthlessly and writes like a drunken angel," our reviewer, Jennifer Senior, wrote, "making targets of subjects as various as Mother Teresa, Henry Kissinger, the Clintons and God."

I'D KNOW YOU ANYWHERE, by Laura Lippman (Morrow, $14.99.) Lippman's psychological-suspense novel revolves around Eliza Benedict, a suburban wife and mother who was kidnapped at age 15 and held for weeks by a rapist and murderer. Years later, Eliza agrees to visit her former captor on death row.

QUANTUM: Einstein, Bohr, and the Great Debate About the Nature of Reality, by **Manjit Kumar** (Norton, $16.95.) This is a lively account of the debate, in the early 20th century, over the first theories of quantum mechanics: the revolutionary idea that lies at the subatomic base of physical reality.

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The Daily Telegraph

The Daily Telegraph (London)

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THE SCIENCE OF COMEDY;
You don't have to leave your brain at the door when going to a gig. Manjit Kumar meets the comedian who is taking Brian Cox and other scientists on tour

BYLINE: Manjit Kumar

SECTION: REVIEW;FEATURES; Pg. 9

LENGTH: 975 words

The "free visitor destination for the incurably curious", otherwise known as the Wellcome Collection, opposite London's Euston station, seemed an apt place to meet Robin Ince, comedian and co-presenter of Radio 4's science-meetshumour chat show The Infinite Monkey Cage.

"There are a lot of intelligent, well-read comedians out there who are interested in science and who want to share their passions," says Ince, who has done more than anyone to help them do just that. He is the brains behind Nine Lessons and Carols for Godless People, a variety show that celebrates science while giving the audience a healthy dose of humour and music.

Each Christmas since 2008 the shows have played to packed houses of nonreligious people grabbing the opportunity to laugh out loud at the likes of comedian and trained physicist Dara O'Brien and being entertained by bitesized lectures from scientists like the evolutionary biologist Richard Dawkins. "If the Royal Variety Show was put in a matter transportation machine with the Royal Institution Christmas Lectures," says Ince, "this is what you'd get." It's what he calls "reading-list comedy", because it's all about ideas that leave the audience wanting more - and a bibliography.

Ince is about to give them more with his new tour, Uncaged Monkeys: A Night of Science and Wonder, opening in Oxford tomorrow and ending with two nights at London's Hammersmith Apollo on May 16 and 17.

Ince's fellow "monkeys" will be Brian Cox, recently on our screens presenting Wonders of the Universe; Ben Goldacre, psychiatrist and slayer of bad science; and Simon Singh, the best-selling science writer and celebrated debunker of the claims of alternative medicine. With their guests the quartet will be tackling everything from the Big Bang to bonobo apes and anything else they can cram into two hours.

Once again the driving force, Ince describes himself as "the idiot who will guide the audience". Though he loved science as a child, he explains that he lost interest in it around the age of 13, "when science seemed to become facts and dull experiments with apparently no link to the world".

There was, he regrets, "no sense that the periodic table is really the ingredients list of the universe so far". It was only in his mid twenties that the popular books of Nobel Prize-winning, bongo-drum-playing physicist Richard Feynman rekindled his curiosity for all things scientific.

"Taking a tour about science to theatres that seat up to 3,000 people is a project I've wanted to do for a long time," admits Ince. The fact that he can do so may in part be down to an English-born, Canadian journalist and writer living in New York, one Malcolm Gladwell.

In November 2008, Gladwell's two performances at the Lyceum, one of the largest theatres in London's West End, were quickly sold out. A staffer at the New Yorker magazine, Gladwell is often described as one of the most brilliant and influential writers of his generation.

His bestselling books, such The Tipping Point and Blink, identify and explore social trends and behaviour in novel ways. After his gigs in London he returned to Britain the following year to play four dates at venues that you'd normally associate with hip indie bands. Gladwell, with his afro and charisma, made ideas sexy, very much as Brian Cox is doing today.

Ince and Cox's fellow uncaged monkey Simon Singh identifies three distinct types of event that are taking place: listening to scientists (lectures), discussing with scientists and celebrating science. "People have always gone to science lectures," he says, "but the discussion and celebration of science in pubs and theatres is new." He recently introduced a lecture by American physicist Brian Green to an audience of 900 at the Southbank.

He admits that big events at big venues, like the Uncaged Monkeys or a lecture by a world-famous scientist, might not be "everybody's cup of tea".

For those who prefer things on a smaller scale, there is an ever-growing number of events like The Bright Club, a monthly variety night founded in 2009 by comedy promoter Miriam Miller and Steve Cross, University College London's head of public engagement, as an arena for the staff and students from UCL to break free from the desks and labs and perform routines based on their research.

"Physically going out to these events involves a different level of engagement, than, say, watching Horizon at home, because you form part of the evening as an audience member," says Miller. "You can go with friends and discuss the issues raised in the break or on the bus home, and at some of these events you can even interact with the people presenting information to you."

She believes that we have all the information in the world at our fingertips but that we don't necessarily spend time discussing it with other people. She also believes that this social aspect is an important one:

people who are interested in intelligent things usually don't get to enjoy them together.

"Traditionally they'd watch TV or read books, both of which are pretty solitary," argues Cross. "Other than that there are public lectures, which can be great, but most people just aren't used to being lectured at for an hour."

It seems more of us are prepared to let loose our inner geek, even if it's just for the odd night. And it's something that excites Ince because, "when you go to a well-run science gig, you don't just come out saying 'That was fun', you leave with your mind reeling with ideas that haunt and intrigue you". We are not yet a nation of science-loving geeks, but as Ince says: "People now aren't afraid to admit they like science. How can someone wilting under a stack of celebrity swimsuit mags belittle someone looking up at the stars?

" Uncaged Monkeys: A Night of Science and Wonder starts in Oxford tomorrow. Full information can be found at www.robinince.com

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GRAPHIC: Robin Ince: 'I am the idiot who will guide the audience'
Looking up at the stars: no longer for the closet geeks
BABAK TAFRESHI

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The Daily Telegraph
The Daily Telegraph (London)

April 9, 2011 Saturday
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Tracking the flight of time's arrow

BYLINE: **Manjit Kumar**

SECTION: REVIEW;FEATURES; Pg. 29

LENGTH: 719 words

From Eternity to Here: the Quest for the Ultimate Theory of Time by Sean Carroll

438PP, ONEWORLD, £12.99 T £11.99 (PLUS £1.25 P&P) 0844 871 1515 ****

'What is time?" It's the sort of question asked by philosophers, physicists and, sooner or later, children. While reading From Eternity to Here I was relieved that my eight-year-old was actually asking "What is the time?" That was a question I could answer. As for the other, most of us would side with St Augustine: "If no one asks me, I know. If I wish to explain it to one that asketh, I know not."

St Augustine, having tackled original sin, contemplated the nature of time and concluded that "neither future nor past exists, and it is inexact language to speak of three times - past, present and future". There, in a nutshell, is the problem that Sean Carroll, a theoretical physicist at the California Institute of Technology, explores in this fascinating book. Why is there a past, present and future? In other words, why is there an "arrow of time"?

Before Einstein, it had long been assumed that time and space were fixed and distinct, the stage on which the never-ending drama of the cosmos was played out. Einstein discovered space and time were not absolute and unchanging, that spatial distances and time intervals between events depended on the relative motion of observers. He found that space and time were woven together to form the fabric of the universe: spacetime.

Yet there is one crucial difference between space and time. While it is possible to move in any direction in space, the ticks of a clock forever march time forward. This inexorable flight of time's arrow from past to present to future is bound up with the second law of thermodynamics. Put simply, the amount of disorder, what physicists call entropy, increases with the passage of time.

Breaking eggs to make an omelette, stirring milk into coffee or spilling wine all exhibit, says Carroll, "the fundamental irreversibility that is the hallmark of the arrow of time".

It is the increase in entropy, in the disorderliness of the world, which makes these everyday events irreversible and separates the past from the future. Eggs can't spontaneously unscramble or spilt wine jump back into the bottle because that would lead to a decrease in entropy. But why should entropy always increase?

"Understanding the arrow of time is a matter of understanding the origin of the universe," Carroll argues. For him the reason we can't unscramble an egg is due to the low entropy conditions in the early universe some 13 billion years ago.

Attempting to explain how such a low entropy state was possible has led Carroll to become one of an increasing number of physicists who in recent years have begun to question whether the Big Bang was really the beginning of the universe. For him it is "simply a plausible hypothesis, not a result established beyond reasonable doubt" and it is conceivable that space and time extend beyond the moment that we identify as "the Big Bang".

Traditionally, questions about what was there "before the Big Bang" have been dismissed as meaningless, since space and time were deemed to be created at the Big Bang there simply was no "before". Instead of the universe, theorists now talk of the "multiverse" and "baby universes" that Carroll believes provide "a natural mechanism for creating more and more entropy in the universe".

From Eternity to Here is not for the faint hearted, but it's a rewarding read because there are no answers yet to some of science's toughest questions.

"There are ideas, and some ideas seem more promising than others, but all of them are somewhat vague, and we certainly haven't yet put the final pieces together," admits Carroll as he guides the reader through some of the most exotic parts of the landscape of modern theoretical physics and cosmology: from evaporating black holes to wormhole construction, from the many worlds interpretation to cosmic inflation.

But the question remains: "what is time?" The response of the American physicist John Wheeler is worth remembering: "Time is nature's way of keeping everything from happening at once."

Manjit Kumar

Manjit Kumar's last book was Quantum: Einstein, Bohr and the Great Debate about the Nature of Reality (Icon)

Carroll guides the reader through some of the most exotic parts of cosmology

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Arts & Book Review

March 25, 2011
First Edition

Measuring multiverses;
THE BOOK OF UNIVERSES by John D Barrow Bodley Head, £20, 354pp £18 from the Independent Bookshop: 08430 600 030

BYLINE: **Manjit Kumar**

SECTION: BOOKS; Pg. 28

LENGTH: 572 words

"Einstein explained his theory to me every day and on my arrival I was fully convinced that he understood it," reported Chaim Weizmann. He would become the first president of Israel, but in 1921 was accompanying Einstein on a transatlantic voyage to New York. The theory in question was general relativity, in which gravity is due to the warping of space caused by the presence of mass. The Earth moves around the Sun not because some mysterious invisible force pulls it, but because of the warping of space due to the Sun's enormous mass.

"The theory is beautiful beyond comparison," Einstein wrote. When, in November 1919, British astronomers announced that they had discovered that gravity bends light - as predicted by general relativity - it made

headlines around the world. Yet buried within his greatest achievement was what Einstein called "my greatest blunder".

He knew that his equations could be solved in a number of different ways, with each solution representing a model of a possible universe. Like everyone else at the time, Einstein believed that the actual universe was eternal and unchanging. So he introduced a term (his "greatest blunder") into the equations that ensured exactly that. It was left to others, a Russian mathematician and then a Belgian Jesuit priest, to find and take seriously the solutions that pointed to an expanding universe. Soon this non-static model attracted some experimental support.

In the 1920s, the American astronomer Edwin Hubble discovered two remarkable facts. First, what we had long assumed to be the universe was actually our host galaxy and there were many other such "island universes". Second, he found that light from these distant galaxies was stretched towards the red end of the visible spectrum. This so-called redshift is evidence that these galaxies are moving away from our own Milky Way and that the universe is expanding.

Eventually, this led theorists to a universe that was exploded into being in a Big Bang some 13 billion years ago from a single point, called a singularity, which was infinitely hot and dense. Add a surge of accelerated expansion only a trillion trillion trillion trillionth of a second after the Big Bang that lasted for only a trillion trillion trillionth of a second, and the discovery that 96 per cent of it is made up of dark matter and dark energy, then we arrive at the most popular model of our universe.

In the 20th century, cosmology became a bonafide scientific discipline, but there remains plenty of room for some metaphysical speculation. What exactly do we mean by "universe"? Is the universe everything that has existed, does exist and will ever exist? asks Cambridge cosmologist John Barrow. What about including all that cannot exist? After all, as he points out, some medieval philosophers "were drawn to this sort of completeness, adding everything that has existed, does exist and will not exist to the catalogue of what was, is and will be".

Barrow and his colleagues are not only interested in the structure and history of our universe. There are other universes that live inside black holes, or are chaotically unpredictable or allow time travel into the past. However, the most mind-numbing concept of all only emerged in the 1990s: the never-ending "multiverse" - the universe of all possible universes. There can be few better guides to the bewildering array of potential universes, and none so readable or entertaining.

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Independent Extra

March 3, 2011 Thursday
First Edition

The man who went nuclear;
Science 100 years ago this week a Manchester University professor revealed the nuclear atom. Manjit Kumar explains how Ernest Rutherford ushered in the atomic age

BYLINE: Manjit Kumar

SECTION: VIEWSPAPER; Pg. 10

LENGTH: 1560 words

Did the nuclear age begin in 1942, when Chicago Pile-1, a reactor built in a squash court, went "critical" by achieving self-sustaining chain reaction?

Or was it on 16 July 1945 in the Jemez mountains in New Mexico, when "The Gadget", the first atomic bomb, was successfully tested and Robert Oppenheimer quoted the Bhagavad Gita? Maybe it was June 1954, when the Russian Obninsk nuclear station first generated electricity for the grid.

In reality, it was during a meeting of the Manchester Literary and Philosophical Society that the nuclear age was announced, on Tuesday, 7 March 1911, by Professor Ernest Rutherford, the 39-year-old head of physics at Manchester University. Rutherford was born in 1871, in Spring Grove, New Zealand. Descended from Scottish emigrants, it was from this scattered rural community on the north coast of the South Island that Rutherford's aptitude for science and maths led in 1895 to a coveted place at Cambridge. There, under the direction of JJ Thomson, Rutherford established a reputation as a fine experimentalist with a study of X-rays.

Though surrounded at Cambridge by all the excitement generated by Thomson's discovery of the electron in 1897, Rutherford opted to investigate radioactivity and soon found that there were two distinct types of radiation emitted from uranium, which he called alpha and beta, before a third was discovered, called gamma rays.

Aged just 27, in 1898, he was appointed professor of physics at McGill University in Montreal, Canada. Among his successes over the next nine years the most important was the discovery, with his collaborator Frederick Soddy, that radioactivity was the transformation of one element into another due to the emission of an alpha or beta particle.

Rutherford regarded "all science as either physics or stamp collecting" but saw the funny side when he received the 1908 Nobel prize for chemistry for this seminal work. By then he was in Manchester.

"Youthful, energetic, boisterous, he suggested anything but the scientist," was how Chaim Weizmann, then a chemist but later the first president of Israel, remembered Rutherford in Manchester.

"He talked readily and vigorously on any subject under the sun, often without knowing anything about it.

"Going down to the refectory for lunch, I would hear the loud, friendly voice rolling up the corridor."

At the time Rutherford was busy using the alpha particle to probe and unlock the secrets of the atom. But what exactly is an alpha particle? It was a question that Rutherford and his German colleague Hans Geiger answered. It was a helium ion; that is, a helium atom that had been stripped of its two electrons. Rutherford had noticed, while still in Montreal, that some alpha particles passing through thin sheets of metal were slightly deflected, causing fuzziness on a photographic plate. It was something he asked Geiger to

investigate.

As instructed by Rutherford he fired beams of alpha particles at some gold foil and by the tiny flashes of light when they struck a zinc sulphide screen discovered that a few "were deflected through quite an appreciable angle". Soon afterwards Rutherford assigned a research project to a promising undergraduate called Ernest Marsden: "Why not let him see if any alpha particles can be scattered through a large angle?"

Marsden found some alpha particles bouncing straight back after hitting the gold foil and Rutherford was shocked: "It was almost as incredible as if you had fired a 15-inch shell at a piece of tissue paper and it came back and hit you."

Marsden and Geiger made comparative measurements using different metals and they discovered exactly they same large angle scattering. In June 1909 they published their extraordinary results, but with Rutherford unable to offer any kind of explanation they attracted little interest.

After decades of intense arguments, by 1910 the reality of atoms was established beyond reasonable doubt. The most widely-accepted atomic model was Thomson's so-called "plum pudding". Its ingredients consisted of a ball of diffuse "positive electricity" in which negatively charged electrons were embedded like plums in a pudding. But Rutherford knew that the atom of his old mentor couldn't explain alpha particle scattering. The probability that the accumulated effect of a number of tiny ricochets off electrons in Thomson's atom resulted in even one alpha particle being scattered backwards was almost zero. By December 1910, Rutherford believed that given the mass and energy of an alpha particle the large deflections must be the result of a single collision with an atom. It led him "to devise an atom superior to J.J's" he said at time.

Rutherford's atom consisted of a tiny central core containing virtually all the atomic mass, which he later called the nucleus, but it occupied only a minute volume "like a fly in a cathedral".

Most alpha particles would pass straight through Rutherford's atom in any "collision", since they were too far from the tiny nucleus at its heart to suffer any deflection. But if an alpha particle approached the nucleus head-on, the repulsive force between the two would cause it to recoil straight back like a ball bouncing off a brick wall. Rutherford said that such direct hits were "like trying to shoot a gnat in the Albert Hall at night". Rutherford's model allowed him to make definite predictions using a simple formula he had derived about the fraction of scattered alpha particles to be found at any angle of deflection.

Experimental checks performed by Geiger and Marsden confirmed the predictions, but few physicists beyond Manchester gave any serious attention to the nuclear atom.

Although Rutherford did not explicitly suggest a planetary model of the atom, there were those who knew that's exactly what it was. For most that settled the matter, Rutherford's atom was fatally flawed.

A model of the atom with electrons moving around the nucleus, like planets orbiting the sun, would collapse. Any object moving in a circle undergoes acceleration, if it happens to be a charged particle, like an electron, as it accelerates it continuously losses energy in the form of radiation.

An electron in orbit around the nucleus would spiral into it. Rutherford's atom was unstable and the existence of the material world was compelling evidence against it.

Enter Niels Bohr.

Arriving in Manchester in March 1912 to learn about radioactivity, it wasn't before long the 27-year-old Dane began thinking about how to prevent Rutherford's nuclear atom from collapsing. His solution employed the quantum - the idea that energy comes in packets. Bohr argued that electrons inside an atom could only move in certain orbits in which they did not radiate energy and therefore couldn't spiral into the nucleus. Bohr said that each orbit had a certain energy associated with it, so all the allowed orbits were in effect a series of energy levels, like the rungs of a ladder. For an electron to move between levels, the famous quantum leap, required it to absorb or emit a quantum of energy that was equivalent to the difference in energy between the two levels.

"It is difficult to underestimate the scientific importance of the discovery of the nucleus," says Sean Freeman, professor of nuclear physics at Manchester University.

"Rutherford's insight, imagination and attention to detail enabled him to make revolutionary discoveries using rather rudimentary technology by modern standards. He was a true pioneer."

One of his most important achievements was made in his spare time while Rutherford was developing methods for detecting submarines during the First World War - he split the atom. Arriving late for a committee meeting one day, Rutherford didn't apologise, but announced: "I have been engaged in experiments which suggest that the atom can be artificially disintegrated.

"If it is true, it is of far greater importance than a war!"

It was 1919 before he published the results that showed the nucleus contained positively charged particles he called protons by knocking them out of nitrogen nuclei using alpha particles - thereby effectively splitting the nucleus and hence the atom.

It was the last work he did at Manchester before moving to Cambridge to take over from Thomson as head of the Cavendish Laboratory.

It was there that in 1932 his colleagues James Cockcroft and Ernest Walton "split the atom" using the world's first particle accelerator. Also at the Cavendish, James Chadwick used Rutherford's suggestion that there was probably another constituent to heavier nuclei to discover the neutron. The particle plays the central role in establishing a nuclear chain reaction. The three men were among the 11 former students and colleagues of Rutherford who would win the Nobel prize.

Another of those 11 was Niels Bohr, who said that Rutherford never spoke more angrily to him than he did one evening at a Royal Society dinner.

He had overheard Bohr refer to him by his title (Rutherford was awarded a peerage in 1931) and angrily asked the Dane loudly: "Do you Lord me?"

Rutherford never cared for the honours and was indifferent to academic or social standing. What mattered most to him were the results of experiments. "I was brought up to look at the atom as a nice hard fellow, red or grey in colour, according to taste," he once said.

It was a model he replaced with an atom that began the nuclear age.

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JOURNAL-CODE: IE

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Mail & Guardian

February 23, 2011

The heretical idea of making people

BYLINE: Manjit Kumar

LENGTH: 841 words

Unnatural: The Heretical Idea of Making People by Philip Ball The award of the Nobel prize, when it came in October 2010, was long overdue. By then there was more than three decades' worth of growing evidence to back up the claim of two British men. About four million people, none older than 33, were living proof of their pioneering work in developing the technique of in vitro fertilisation (IVF). Sadly for the gynaecologist and surgeon, Patrick Steptoe, who died in 1988, the Nobel isn't awarded posthumously. Therefore, the sole recipient was the physiologist, Professor Robert Edwards, who at 85 was too ill to travel to Stockholm to collect the prize in person. Since the birth of Louise Brown on July 25 1978, IVF has helped and offered hope to some of the 10% of all couples worldwide who suffer from infertility. Yet the birth of the "first test-tube baby" at Oldham General hospital in the English town of Oldham outraged many for being the product of an unnatural interference by scientists in the creation of a human being. Repeatedly having to fend off charges that he was playing God, Edwards once complained that the early response to IVF was conditioned by "fantasies of horror and disaster, visions of white-coated, heartless men, breeding embryos in the laboratory to bring forth Frankenstein genetic monsters". Philip Ball, who in **Critical Mass** explored how one thing leads to another, points out in his latest book,

Unnatural, that traditionally the "natural" end of sex is procreation because the latter requires the former. However, religious objections to IVF, Ball argues, invoke this reasoning in reverse: the natural beginning of procreation is sex -- not sex in terms of sperm meets egg, but in the anatomical sense. Hence, Ball's interest in exploring what lies beyond the "this bit goes in here" method. The result is a fascinating and impressive cultural history of anthropoeia -- the centuries of myths and tales about the artificial creation of people. Ball explores what these fables reveal about contemporary views on life, humanity and technology as modern science has turned the fantasy of making people into reality. From the homunculus of the medieval alchemists and the clay golem of Jewish legend to Frankenstein's monster and the babies in jars of Huxley's **Brave New World**, Ball ranges far and wide to show that the idea that making life is either hubristic or "unnatural" is a relatively recent one. **Artificial life** Until the Enlightenment, it was widely assumed that it was possible to make lower forms of life. For example, a process called bougonia in which bees were created using the carcasses of dead oxen was once accepted as fact. It was only in the 19th century that "spontaneous generation", the belief that life could spring forth from inanimate matter without the need for seeds, eggs or parents, was finally discredited. If there were any doubts about such practices, explains Ball, they were about the quality and character of "artificial life": Was it inferior, equivalent or better than "natural" life? The ultimate "unnatural" act is the artificial creation of humans, because it challenges the conviction that we are God's chosen. Yet Ball makes a persuasive case when he suggests that the response of the medieval mind to the idea of artificial human life was very different from the horror it now typically engenders. This indicates that feelings of revulsion about these "unnatural" creations are not inevitable. The prefix "un"

was attached only to acts that were deemed reprehensible because they were **contra naturam**, against nature. Yet, people in the Middle Ages saw nothing intrinsically wrong in creating human and other forms of life. The problem for them was rather, as the 12th-century Muslim scholar Averroes said, that organisms made by art were like alchemist's gold, a kind of fake. In short, any "unnatural" creation lacked a soul. Doubts about the possibility of an artificial person having a soul are still with us, though given a modern spin. The fabricated being is denied genuine humanity. He or she is thought to be soulless: lacking in love, warmth and human feeling. This same failing is now imputed to human clones -- 21st-century reincarnations of Frankenstein's monster, as the very term carries connotations of spiritual vacancy. A skilled practitioner of the book-length essay, Ball can also be wonderfully succinct: "'Soul' has become a kind of watermark of humanity, a defence against the awful thought that we could be manufactured." Debates about the pros and cons of human embryo research, cloning and the like require a focus on issues that are rooted in the particularities of our time and culture. Ball's thoughtful book is a reminder that as we try to deal with how to enable and assist people into being, we need to understand and then conquer our fears surrounding the very idea of making people. -- **Guardian News & Media 2011Manjit Kumar's books include Quantum: Einstein, Bohr and the Great Debate About the Nature of Reality**

LOAD-DATE: January 4, 2012

LANGUAGE: ENGLISH

NOTES: The award of the Nobel prize, when it came in October 2010, was long overdue.

PUBLICATION-TYPE: Newspaper

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Mail & Guardian

February 23, 2011

The heretical idea of making people

BYLINE: Manjit Kumar

SECTION: WORLD

LENGTH: 836 words

HIGHLIGHT: The award of the Nobel prize, when it came in October 2010, was long overdue. >

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Manjit Kumar's books include Quantum: Einstein, Bohr and the Great Debate About the Nature of Reality

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THE TIMES
The Times (London)

February 12, 2011 Saturday
Edition 1;
National Edition

These dark materials

BYLINE: Manjit Kumar

SECTION: SATURDAY REVIEW;FEATURES; Pg. 10

LENGTH: 602 words

The 4% Universe by Richard Panek OneWorld, £10.99 £8.99; 320pp

For Galileo, seeing was believing. When in 1609 he learnt of the Dutch invention of the telescope, he quickly constructed his own. With no reason to think that there was anything to find, he searched the night sky and found that there was far more to the Universe than meets the naked eye. He saw that the Moon had mountains, the Sun had spots and he observed the phases of Venus. With the discovery of Jupiter's moons, Galileo found evidence that not all heavenly bodies revolved around the Earth. In March 1610 he published The Starry Messenger, his report of what he had seen. All 500 copies sold within a week.

Four centuries later Galileo's successors know that they cannot see, even using their dazzling variety of modern telescopes, an astonishing 96 per cent of the Universe. The tiny fraction that is visible to their finetuned instruments is the stuff that we and all the countless planets, stars and galaxies are made from. Get rid of us and of everything else that we've ever thought of as the Universe and very little would change. "We're just a bit of pollution," one cosmologist says. We may be irrelevant but the rest of reality has been dubbed "dark", and for the American science writer Richard Panek it "could go down in history as the ultimate semantic surrender". For this is not "dark" as in distant or invisible, but "dark" as in unknown - for now at least.

Yet what is known is that almost a quarter of what can't be seen is something called dark matter. Although its very nature is a mystery, its presence is discernible through its gravitational effect on the movement of galaxies. Without dark matter the astronomical data doesn't make sense.

From a derelict iron mine in Minnesota to mountaintop observatories, at a pace that would shame many a thriller writer, Panek tells the story of the quest to unlock the secrets of dark matter and the particles that make it up. These weakly interacting enormous particles have proven so elusive that the possibility that two were found in November 2009 caused great excitement.

Dark matter is less than half the tale that Panek wants to tell. For three quarters of the unknown Universe consists of an even stranger substance called dark energy. Its existence was inferred, once again, from the circumstantial evidence gathered by astronomers measuring what could be seen. They didn't need Sherlock Holmes to remind them that after eliminating the impossible, whatever remains, no matter how improbable, is the truth.

In the late 1990s two rival teams set out to collect data on distant supernovae in an attempt to determine the rate at which the Universe was expanding. It was assumed that the pull of gravity would act as a brake on the pace of expansion. To their disbelief they found that space-time was being pushed apart faster than ever before. Something was overwhelming the force of gravity to drive the expansion. Dark energy was winning the cosmic tug-of-war.

With a future Nobel prize at stake, disputes and arguments over who did what and when were inevitable. Panek provides a behind-the-scenes glimpse of science in the raw as alliances are forged and friendships strained. There is a new Universe to explore and the latest experiments reveal that it is 13.75 billion years old and made up of 72.8 per cent dark energy, 22.7 per cent dark matter and 4.5 per cent ordinary matter. These numbers are "an exquisitely precise accounting of the depths of our ignorance", Panek says. "It's 1610 all over again."

LOAD-DATE: February 12, 2011

LANGUAGE: ENGLISH

GRAPHIC: ACROSS THE UNIVERSE Dark matter helps to make sense of astronomical data YANNICK MELLIER / SPL

PUBLICATION-TYPE: Newspaper

JOURNAL-CODE: TIM

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Independent Extra

February 10, 2011 Thursday
First Edition

Culture under the microscope; Science A new exhibition features works made from cells, proteins and living tissue. Does this biological art belong in a gallery - or back in the lab? By Manjit Kumar

BYLINE: **Manjit Kumar**

SECTION: VIEWSPAPER; Pg. 10

LENGTH: 962 words

What is Life? It's a question that the quantum physicist Erwin Schrödin- ger tackled in three famous lectures given at Trinity College, Dublin. The first, on 5 February 1943, was heard by an audience that included the entire Irish cabinet led by ??amon de Valera.

Schrödinger is remembered today for making vivid the weirdness of the quantum world with his famous cat-in-the-box thought experiment. Schrödinger's cat is neither dead nor alive but exists in a superposition of states until we open it and look. Yet when his Trinity College lectures were published they became influential in persuading many young physicists that Schrödinger's methods might solve some of the problems in the developing field of molecular biology. James Watson and Francis Crick cited the book as a key inspiration for the research that led them to the discovery of the double-helix structure of DNA.

"Schrödinger with his mythical ' 'semi-living' cat, could be described as a pioneer of BioArt," says Dr Michael John Gorman, the director of Dublin's Science Gallery, which is also located in Trinity College. His tongue is firmly in his cheek as he accompanies 40 people on the short walk from his gallery to the Schrödinger Theatre, to discuss what life is. This is one of the many activities surrounding the gallery's latest exhibition, Visceral: The Living Art Experiment.

"BioArt" was a term coined in 1997 as a number of artists abandoned paints and brush in favour of cells,

fragments of DNA, proteins and living tissue. Visceral, a month-long exhibition uses new technologies, tissue and neural engineering to explore the question "what is life?" People may be put off by some of the 15 works, some of which use human tissue as book covers or retinal cells to project film. Gorman admits there is something a little queasy about creating artworks from living tissue. "The very idea of tissue-engineering becoming an art form makes us squirm," he says. However, Visceral is all about provoking the sort of instinctive gut reaction that Gorman hopes will gets visitors asking questions about the ethical implications of manipulating living material and what we mean by "living".

The exhibition's curator, Oron Catts, believes that the "logic that drives things like nanotechnology, synthetic biology and even things like neuroengineering needs to be scrutinised and explored by people other than just scientists and engineers". It was one of the reason that Catts helped to set up SymbioticA, an artistic lab dedicated to a hands-on engagement with the life sciences based at the University of Western Australia in Perth.

"Our interest is in life," says Catts, "not only art or science." Yet the exhibition demonstrates the depth of the potential of interactions between art and science. For Gorman, nothing illustrates this better than Silent Barrage, the largest work on show. The product of a collaboration between Neurotica, a group of five artists, and Dr Steve Potter of the Georgia Institute of Technology in Atlanta, its a cutting edge piece of neural engineering. It consists of an array of robotic poles hooked up to neurons from the brains of rats in Potter's lab.

The array responds to the way visitors move through it and sends signals back to the neurons. These neurons then fire, making the robotic poles shudder up and down. Depending on the amount of audience activity, the neurons can undergo what is called a "barrage" - when they start firing in a chaotic fashion. This is exactly what happens during an epileptic seizure. With epilepsy affecting over 450000 people in the UK alone, it is hoped by the scientists involved that the data collected might lead to a better understanding of the process by which cells are calmed and seizures mitigated. And its not the only exhibit that promises something scientifically tangible.

The battlefield of Kathy High's Blood Wars is a Petri dish with the combatants being the white blood cells drawn from two different people. After a few hours slugging it out, one set of platelets will have destroyed the other. The "winner" of each cellular battle goes on to fight another participant.

The concept may sound sinister to some with concerns about eugenics, but it is in an ingenious attempt to engage in the age-old debates surrounding traits inherited through blood.

Catts says that cell lines create a form of immortality since they can live beyond the life of the donor. I'm reminded of the story told by Rebecca Skloot in her bestselling book, The Immortal Life of Henrietta Lacks. Known to scientists as HeLa, Lacks died in 1951 but her cancer cells were taken without her knowledge and became one of the most important tools in medicine. The Vision Splendid, a work by Alicia King consists of two sealed glass jars, connected by tubes that contain nutrients and cultured human tissue. The cells were those of an unknown African-American girl aged 13. You're left wondering who owns the stuff our bodies are made of. If that worries you, then Catts offers a way to ease your troubles.

The Semi-Living Worry Dolls by Catts and Ionat Zurr are a modern version of the famous Guatemalan worry dolls constructed out of degradable polymer on which cells are grown in micro-gravity conditions. You can whisper your troubles to them through a microphone as they eventually replace the polymer completely, transforming the piece from fabric to tissue.

With the Irish general election rescheduled for the closing date of Visceral on 25 February, there's a rumour going around that the Silent Barrage installation may be able to predict the outcome - if political candidates are willing to present themselves to the cultured rat neurons in person.

The Visceral Exhibition at the Science Gallery, Dublin runs until 25 February. sciencegallery.com

LOAD-DATE: February 9, 2011

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JOURNAL-CODE: IE

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The Guardian (London) - Final Edition

February 5, 2011 Saturday

Review: NON-FICTION: Manufacturing dissent: Manjit Kumar enjoys a thoughtful look at our fears about creating artificial life: Unnatural: The Heretical Idea of Making People by Philip Ball 373pp, Bodley Head, £20

BYLINE: Manjit Kumar

SECTION: GUARDIAN REVIEW PAGES; Pg. 8

LENGTH: 834 words

The award of the Nobel prize, when it came in October 2010, was long overdue. By then there was more than three decades' worth of growing evidence to back up the claim of two British men. Around 4 million people, none older than 33, were living proof of their pioneering work in developing the technique of in vitro fertilisation (IVF). Sadly for the gynaecologist and surgeon Dr Patrick Steptoe, who died in 1988, the Nobel isn't awarded posthumously. Therefore the sole recipient was the physiologist Professor Robert Edwards, who at 85 was too ill to travel to Stockholm to collect the prize in person.

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Philip Ball, who in Critical Mass explored how one thing leads to another, points out in his latest book,

Unnatural, that traditionally the "natural" end of sex is procreation since the latter requires the former. However, religious objections to IVF, Ball argues, invoke this reasoning in reverse: the natural beginning of procreation is sex - not sex in terms of sperm meets egg, but in the anatomical sense. Hence, Ball's interest in exploring what lies beyond the "this bit goes in here" method. The result is a fascinating and impressive cultural history of anthropoeia - the centuries of myths and tales about the artificial creation of people.

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Until the Enlightenment, it was widely assumed that it was possible to make lower forms of life. For example, a process called bougonia in which bees were created using the carcasses of dead oxen was once accepted as fact. It was only in the 19th century that "spontaneous generation", the belief that life could spring forth from inanimate matter without the need for seeds, eggs or parents, was finally discredited. If there were any doubts about such practices, explains Ball, then they were about the quality and character of "artificial life" - was it inferior, equivalent, or better than "natural" life?

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Manjit Kumar's books include Quantum: Einstein, Bohr and the Great Debate About the Nature of Reality (Icon). To order Unnatural for £16 with free UK p&p call Guardian book service on 0330 333 6846.

LOAD-DATE: February 5, 2011

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newspaper

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New Scientist

January 22, 2011

BYLINE: **Manjit Kumar**

SECTION: OPINION; No. 758

LENGTH: 179 words

Love a rock

We're unlikely to get killed by a meteorite, so why worry about them?

Geological aliens

Incoming! Or, why we should stop worrying and learn to love the meteorite by Ted Nield, Granta Books, £20

Reviewed by **Manjit Kumar**

FROM AD 218 to 222 the Roman empire worshipped a meteorite. This bizarre episode ended when the transsexual priest-emperor Elagabalus was hacked to bits and hurled into the Tiber. This is just one of the many stories Ted Nield skilfully weaves into his entertaining history of meteorites.

In July 2010, two spectators at a cricket match in Sussex in the south of England witnessed an extremely rare meteor strike. The rock, 12 centimetres long, broke in two when it hit the ground with a piece ricocheting into the chest of one man. Luckily he was unharmed. Nield reckons the "global risk of death by extraterrestrial impact to be a negligible 1 in 720,000". Meteorites pose little threat, but says Nield, "we humans have transplanted into meteorites the geological aliens, the heart of our own times, as we searched them for signs of times to come".

LOAD-DATE: January 20, 2011

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Magazine

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Canwest News Service

December 28, 2010 Tuesday 11:02 AM EST

Our stealthy tech revolution

BYLINE: Kate Heartfield, Postmedia News

LENGTH: 656 words

Pop quiz: In December 2004, what caused a Michigan man named John Wilkins to exclaim, "This is the day the world changes ... It's beyond what we believed would be possible in our lifetime"?

If you guessed Google Books, good for you. Wilkins is a librarian, quoted in a Daily Telegraph story. Most of the rest of us, though, probably didn't grasp the significance of Google's plan to scan the world's books into a searchable database. Six years later, we probably still don't.

We don't get that we're living in a future more awesome than anyone imagined a generation ago. When we think of futuristic technology, we think of warp engines and robot butlers. When we think about Google Books, we think about copyright and nervous publishers.

But I'm starting to understand why librarians were so excited in 2004.

I am addicted to the new Google Books Ngram Viewer. A ngram is (for our purposes) a word or phrase. You type in your ngrams and the viewer almost instantly gives you a graph showing their popularity in books, over any period you choose between 1500 and 2008. A lot of this is just good silly fun: poring over trends in "vampires" versus "zombies" ate up an embarrassing amount of my time. But spend a few minutes with it, and it becomes clear that the viewer could spark serious discussion or research in the social sciences. "Feminism" peaked in 1996 and has been declining since. Interest in Canada seemed to increase in the Pearson and Trudeau eras, stayed strong through the Mulroney years, then began to fade when Chretien took office.

The Ngram Viewer is still a little buggy. It relies on character recognition software that sometimes gets things wrong; it reads the old-fashioned long "s" as an "f", causing many to wonder why a certain four-letter word that isn't "suck" became so popular circa 1700.

Jon Orwant, engineering manager for Google Books, blogged: "One of the advantages of having data online is that it lowers the barrier to serendipity: you can stumble across something in these 500 billion words and be the first person ever to make that discovery."

What's happening with the Internet and the way we use it is more exciting than most of the utopian fantasies of 20th-century science fiction. It's happening fast because this is a field of invention that's marketable, that doesn't depend on the public sector or philanthropy. We might not have colonies on Mars but we do have iPads.

That profit motive doesn't diminish the scientific importance of innovation. We owe the field of quantum physics to the 19th century's "need to make a better light bulb," as **Manjit Kumar** puts it in his excellent book Quantum: Einstein, Bohr, and the Great Debate about the Nature of Reality. Advances that seem obscure, mundane or even silly at the time -- to lay-people, at least -- can have unimaginably large effects.

Twitter started as a way for small groups of people to share short, banal messages. But it evolved into a platform that, in its chaotic way, makes a kind of sense of the Internet. And it's still evolving, as new applications try to make sense of Twitter. An iPad app called Flipboard creates personalized magazines whose pages change before your eyes according to what certain other people are reading, writing,

videotaping, photographing. That's Harry Potter material. It's magic. It's beautiful. The Flipboard page at the iPad app store quotes a tweet I find revealing: "I didn't know it at the time, but it's the reason I got an iPad."

People who don't have an iPad ask, brow furrowed: "But what do you use it for?" I asked that myself, before I got one. It's the same question people used to ask about personal computers.

The fact is, the iPad and the new apps designed for it are a new thing. That's exciting.

And if we get lackadaisical -- or worse, overwhelmed and cynical -- about advances in technology, we'll look back at this era one day and wonder why we didn't notice what was happening all around us.

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Austin American-Statesman (Texas)

December 26, 2010 Sunday
FINAL Edition

BEST BOOKS OF 2010

BYLINE: AUSTIN AMERICAN-STATESMAN

SECTION: INSIGHT; Pg. D01

LENGTH: 3243 words

'I'd Know You Anywhere'

Laura Lippman

Lippman is brilliant at painting the tragic intersection of past and present, and in this, her finest novel, she explores the eerie relationship between a serial killer facing execution and his one surviving victim, who has built a good life for herself but now must confront long-buried truths.

- Jeff Abbott, author of 'Trust Me'

and the forthcoming 'Adrenaline'

'8th-Grade Superzero'

Olugbemisola

Rhuday-Perkovich

I love a book that leaves my heart feeling twice its normal size, and "8th Grade Superzero" by debut novelist Rhuday-Perkovich was the one that most did that for me this year. The story of how Reggie "Pukey" McKnight's efforts to rescue his own image (see: "Pukey") have a ripple effect on his entire school and the wider community is full of hope, smarts and a whole lot of laughs. Plus, it reveals to the world the secret of what middle-school boys really use their three-ring binders for.

- Chris Barton, author of 'Shark vs. Train'

'Tocqueville's Discovery of America'

Leo Damrosch

The best account in decades of the story behind the most trenchant critique of American politics ever written. Damrosch follows Alexis de Tocqueville and sidekick Gustave de Beaumont about Jacksonian America, looking over their shoulders as they take notes and revealing how Tocqueville shaped his observations - and preconceptions - into the book that made him famous.

- H.W. Brands, professor of history at the University of Texas and author of 'American Colossus: The Triumph of Capitalism, 1865-1900' and 'American Dreams: The United States

Since 1945'

'Colonel Roosevelt'

Edmund Morris

Nobody writes the atmospherics of American history with the panache of Edmund Morris. "Colonel Roosevelt," the final volume of Morris' grand Theodore Roosevelt trilogy, is so brilliantly conceived that it should be considered high art. Beginning with T.R.'s safari to British East Africa in 1909 and ending with our 26th president's death at his Sagamore Hill home in 1919, Morris showcases Roosevelt as a wild-eyed progressive fighting for women's suffrage, national health care and wildlife protection. Morris' chapters on Roosevelt's 1912 Bull Moose Party run for president - including his getting shot in Milwaukee - are particularly riveting. Following Roosevelt around the Amazon, Grand Canyon, Europe and Louisiana is fun stuff. "Colonel Roosevelt" lends credence to the notion that Teddy was an American original like Ben Franklin or Tom Edison, a true-life maverick who also stands tall as a folk legend.

- Douglas Brinkley, professor of history at Rice University and author of the forthcoming 'The Quiet World: Saving Alaska's Wilderness Kingdom, 1879-1960'

'How to Live Safely in a Science Fictional Universe'

Charles Yu

With outstanding story collections from Austin's Doug Dorst and Amelia Gray and deservedly celebrated memoirs from Debra Monroe and Tom Grimes, 2010 offered a wealth of excellent books. I was particularly taken with Charles Yu's novel, "How to Live Safely in a Science Fictional Universe." The story tracks the misadventures of a time machine repairman, also named Charles Yu, as he searches for his father in a half-built universe. Yu's writing is rich with tasty time travel twists and a Douglas Adams-esque wit. Best of all, the novel explores the complex emotional universe shared by a son and his father. Humor, heart-pangs and time-loop paradoxes, it's one sweet smoothie of a novel!

- Owen Egerton, author of 'The Book of Harold, the Illegitimate Son of God'

'Bring Down the Little Birds: On Mothering, Art, Work, and Everything Else'

Carmen Giménez Smith

I recommend "Bring Down the Little Birds," poet Giménez Smith's memoir about mothering during a time when her own mother's health is failing. Usually people recommend memoirs by poets for the "poetic" quality of the prose. This often makes me want to stay away from a book. Giménez Smith, on the other hand, uses her keen talents as a poet in service to the book's structure, creating a story that is as innovative in form as it is honest in emotion. I read the book - linguistically searing and outrageously smart - in one sitting. Like Sylvia Plath's "The Bell Jar" does for young womanhood, "Bring Down the Little Birds" seems to tip motherhood on its side to expose its brutal-though-beautiful underbelly. Reading the book was like an act of initiation.

- Carrie Fountain, author of 'Burn Lake'

'The Four Fingers of Death'

Rick Moody

A massive science fiction novel that was ignored or panned by most critics, perhaps because Moody combines two moods that aren't often associated - an almost punch-drunk silliness and apocalyptic dread. It is a novel that throbs with the American jitters, circa 2010, projected into the declining American sphere of that entity now called NAFTA in 2020.

- Roger Gathman, American-Statesman contributor and author of the forthcoming

'Everyman's Marx'

'Last, Long, Happy'

Barry Hannah

"Last, Long, Happy" is a 450-page compilation of Hannah's best stories, which are a major contribution to American literature and a blast to read. Their celestial lunacy is close to indescribable. Larry McMurtry once called Hannah "the best writer to appear in the South since Flannery O'Connor." Hannah's gone (he died in March), but if you read his work you'll understand that his legacy is permanent. His voice is like no other. Read the book and listen to it.

- Tom Grimes, author of 'Mentor'

'The Immortal Life of Henrietta Lacks'

Rebecca Skloot

I thought "The Immortal Life of Henrietta Lacks" was one of the most amazing books I have read this year. It constantly surprises. Just as you think Skloot is running out of material, she turns a corner and suddenly you are in a new place. I loved the science in it, and I loved the fact that, ultimately, it is a book about Henrietta's daughter, Deborah, or perhaps better to say Skloot's unbelievably dogged pursuit of Deborah and the truth about her mother. The book is really an adventure story.

- S.C. Gwynne, author of 'Empire of the Summer Moon: Quanah Parker and the Rise and Fall of the Comanches, the Most Powerful Indian Tribe in American History'

'Empire of the Summer Moon'

S.C. Gwynne

One of the hottest writing markets is "narrative" history - true tales in which storytelling ability trumps arguing

an ivy-clad historical thesis. Comanche Indians (yes, "Native Americans" are officially "Indians" again) have been under the academic microscope in recent years, increasingly depicted as helpless victims of white American brutality. The wonderful surprise with Gwynne's "Summer Moon" was that it's a ripping good read, it's a template for how to write marketable narrative history, and best of all, it gives a big poke in the eye to the academy. The Comanches were warriors living in a violent culture, and Gwynne's willingness to tally that side of the ledger results in a more textured and more accurate history than the university finds convenient.

- James L. Haley, author of 'Wolf: The Lives

of Jack London'

'C'

Tom McCarthy

Easy, "C" is not - but if you like dark, wry literary fiction that explores the link between 20th century technology and violence, then this one's for you. Young Serge Carrefax flies from the English countryside into the First World War, shelling Germans, and onto erecting radio towers in Cairo. We puzzle through the codes, puns and hieroglyphs that hide him - just what happened to that beautiful sister? - but McCarthy gives Serge as movingly cathartic, and final, an ending as I've read in years. That it comes after a tryst in an Egyptian tomb is the killing joke.

- Christopher Heaney, author of 'Cradle of Gold: The Story of Hiram Bingham,

a Real-Life Indiana Jones, and the Search

for Machu Picchu'

'Quantum: Einstein, Bohr, and the Great Debate About the Nature of Reality'

Manjit Kumar

My favorite book this year was a work of popular science, Kumar's "Quantum," a history of quantum physics in the early 20th century. It features sharply etched portraits of Albert Einstein, Niels Bohr, Werner Heisenberg, Erwin Schrödinger and others, as well as a keen appreciation of the social and political context of the time. Best of all, the really bizarre world of the quantum is very lucidly explained for the mathematically challenged, like me. I may even start wearing a button saying, "Ask me about wave/particle duality!"

- James Hynes, author of 'Next'

'The Sky Is Everywhere'

Jandy Nelson

In Nelson's "The Sky Is Everywhere," 17-year-old Lennie Walker, grief-stricken after the death of her sister, finds comfort and peace in the arms of two loves - Toby, her sister's ex-boyfriend, and Joe, a musical prodigy new to town. Though the novel is about grief and loss, it is also a celebration of love and life, sorrow and second-chances, and Nelson's brilliantly realized characters reinforce the notion that there is no such thing as black and white concerning matters of the heart. Be sure to have your tissues ready.

- Varian Johnson, author of 'Saving Maddie'

'Bonobo Handshake: A Memoir of Love and Adventure in the Congo'

Vanessa Woods

In "Bonobo Handshake," primate scientist Woods shares her experiences working to save great apes in Congo. Just as Jane Goodall documented the lives of chimpanzees, Woods brings readers into the world of

bonobos, recounting the unusual, often humorous challenges that arise while working with a species that famously approaches sex as easily as humans do a handshake. Meanwhile, she also exposes an unsettling and at times devastating side of Congo, explaining how our rush for limited resources has had dire consequences abroad. Above all, this is a story of perseverance, love and hope that transcends a single species.

- Sheril Kirshenbaum, author of

the forthcoming 'The Science of Kissing:

What Our Lips Are Telling Us'

'Hitch-22'

Christopher Hitchens

For more than 40 years, Hitchens has been writing the most learned and insightful political journalism around. His gradual transition from wishy-washy Marxism in the 1960s to an avid supporter of the Iraq invasion in 2003 has enabled him to rankle not only the right, and then the left, but pretty much everyone between. His contrarian perspective, consistently leavened with humor and an appreciation of the absurd, has penetrated topics ranging from Thomas Jefferson to atheism. Of all the virtues of "Hitch-22," one impressed me the most: Hitchens provides an autobiographical account of his numerous twists and turns, reminding us that the examined intellectual life need not be consistent, but rather curious and heartfelt. With Hitchens currently undergoing treatment for esophageal cancer, his gripping memoir is all the more poignant.

- James E. McWilliams, associate professor of history at Texas State University and author of 'Just Food: Where Locavores Get It Wrong and How We Can Truly Eat Responsibly'

'The Museum of Innocence'

Orhan Pamuk

Set in the 1970s when Turkey was westernizing, or its wealthy young elites were, this novel begins with Istanbul seeming like an exotic version of London in the '60s - cigarettes, booze, fashion, sexual adventure - and ends like a 19th century Russian novel. It reminds me, as we export Western values in the name of "nation building," that trends don't undo tradition, that history is bigger than individual desire. It's tender, stark, hopeful, doomed, funny, sad " just beautifully written.

- Debra Monroe, author of 'On the Outskirts

of Normal: Forging a Family Against the Grain'

'Next'

James Hynes

I read numerous wonderful books this year - novels like Jonathan Franzen's "Freedom" and nonfiction such as Elif Batuman's "The Possessed: Adventures With Russian Books and the People Who Read Them" and Barbara Demick's "Nothing to Envy: Ordinary Lives of North Koreans." But nothing impressed me more than "Next" by Austin's own James Hynes. It's a Joycean ramble through present-day Austin in the company of a disappointed academic press editor suffering from middle-aged malaise. Hynes manages to capture Austin's quirk and the neurosis of the aging male, but also manifests of the deepest fears of life of our "age of terror." It really hit home with me. And, I admit, I especially appreciated it, in part at least, because it did not feature twenty-something Brooklynites looking for love, zombies/vampires or murderous Scandinavians - which is what so many novels seem to be about these days.

- Edward Nawotka, editor-in-chief of publishingperspectives.com

'Tinkers'

Paul Harding

Harding's "Tinkers," which won the Pulitzer Prize this year, makes connections from his characters' deepest emotions and lives to a reader's. He causes this by astute observation in brilliant language. We learn something as ordinary as how clocks work, yet also see dramatic epileptic seizures. A vision of the natural world, cruel yet at times beautiful, permeates this complex, original work where time past and present are closely interwoven. It's one of the few books I've wanted to re-read immediately.

- Carolyn Osborn, author of 'Uncertain Ground'

'Secret Historian: The Life and Times of Sam Steward, Professor, Tattoo Artist, and Sexual Renegade'

Justin Spring

I was dazzled by Spring's "Secret Historian," and delighted when this biography became a finalist for the National Book Award. As college professor and author, Sam Steward hung out with Gertrude Stein; as tattoo artist, he inked the Hell's Angels; and as obsessive recorder of his own sex life, he became a source of wonder to Alfred Kinsey. And that's just the tip of the iceberg. This was not your ordinary life, and Spring's book is no ordinary biography.

- Steven Saylor, author of 'Empire: The Novel of Imperial Rome'

'The Shibumi Strategy: A Powerful Way to Create Meaningful Change'

Matthew E. May

This was a very busy year for many in Austin. We're a city of entrepreneurs with Google calendars that routinely account for each hour of the day, leaving us with far too little time to ourselves. The past few months I have been on a (challenging) mission to de-clutter my life. A book that has had a major impact on that journey has been "The Shibumi Strategy," a wonderful fable about an unemployed family man who finds fresh clarity and purpose amid a period of change. His enlightening is centered around a search for Shibumi - a Zen concept without direct translation in English but meaning "effortless effectiveness, elegant simplicity, and the height of personal excellence." It is an entertaining book that provides a fresh perspective on staying true to yourself by finding a more meaningful, and less cluttered, way of life.

- Rusty Shelton, president and CEO

of Shelton Interactive

'The Agency: A Spy in the House'

'The Agency: The Body at the Tower'

Y.S. Lee

I can't stop talking about "The Agency: A Spy in the House" and its already released companion, "The Agency: The Body at the Tower." I don't reach for historicals first, but Lee's Mary Quinn mysteries read like lush, romantic fantasies, with plenty of page-turning intrigue and suspense. I likewise adore Lee's smart, adventurous, Eurasian heroine who so deftly defies the societal expectations of her time. These first two novels in a trilogy are published for older teens, but they're not too edgy for younger ones, and they're definitely sophisticated enough for grown-ups.

- Cynthia Leitich Smith, author of

'Holler Loudly' and the forthcoming 'Blessed'

'Let's Take the Long Way Home'

Gail Caldwell

Caldwell, a Pulitzer Prize-winning journalist, a solitary woman married to words and routine, fell deeply in friendship with the writer Caroline Knapp over long, meandering walks with their loyal dogs. Then, at just 42, Knapp died suddenly of lung cancer. It's a cruel thing to lose your favorite person in the world. And it's wrong that we don't get to keep our beloved dogs forever. But Caldwell doesn't wring her story for tears. She is funny and wistful and tough. I never met Knapp, but now I find myself missing her terribly. She was lucky to have a friend like Caldwell, who continues to love her well.

- Karen Valby, author of 'Welcome to Utopia: Notes From a Small Town'

'My Queer War'

James Lord

Lord, a biographer of Giacometti who also wrote about and knew Picasso, Jean Cocteau, Balthus and Gertrude Stein, wasn't a very good soldier, which he readily admits in this laser-sharp, buoyant account of his service in France during World War II. Lord, who died in 2009, reveals posthumously in "My Queer War" how, as a plucky American, he sidled up to Picasso et al., and his book, which has a lot to reveal about how closely cowardice is allied to courage, is a needed corrective to the spate of chest-pounding World War II memoirs that have already been published.

- Clay Smith, literary director,

Texas Book Festival

'The Naive and the Sentimental Novelist'

Orhan Pamuk

Pamuk's book was a real standout this year. It's extremely difficult to say anything new and interesting about the novel - a mature art form that has long been subjected to the ravages of poststructuralist theory - yet Pamuk manages to do it. The novel at its best can still speak to large audiences, and even has the capacity to change world events, the very flow of history - as, indeed, we might say Pamuk's own novels have done.

Whence does the novel derive this power? While cynical critics have been busy lamenting the death of the novel for decades, great novelists like Pamuk have been engaged in modifying the form for a new audience operating in new communications modes. Pamuk's postmodernism is unique - he's not self-conscious in a defensive way, yet he's in constant conversation with the masters of the past, from Cervantes to Dostoevsky. Reader-reception theory showed us how readers are full participants in the making of novelistic meaning; Pamuk, from his high perch at the pinnacle of contemporary fiction, shows exactly how this happens in practice.

- Anis Shivani, American-Statesman contributor and author of 'Anatolia

and Other Stories'

'The Cardturner'

Louis Sachar

There aren't any wizards or orphaned tweens with special powers. There aren't any postapocalyptic worlds or fantastical clashes. But Sachar's "The Cardturner" is just as rewarding as all those magical realms for its sweet, smart portrait of Alton, a teen who learns the game of bridge and not a few life lessons from his gruff uncle Lester. Sachar, the award-winning author of "Holes," plumbs his own bridge expertise to spin a story

for young adults that's a card-shark's coming of age - and you don't need to be a cardturner to appreciate his sensitive depiction of a young boy growing into a man.

- Sharyn Vane, American-Statesman contributor and writer of a monthly column on children's books

BOX)

Sometimes it's hard

to pick just one

I was dazzled by a couple of the most-touted books out this year, Emma Donoghue's "Room," a mesmerizing miracle of voice, and Sam Lipsyte's "The Ask," a darkly funny, tour de force of verbal pyrotechnics. But the author who haunted my dreams in 2010 was Charles Bowden with his one-two punch of "Murder City: Ciudad Juárez and the Global Economy's New Killing Fields" and "Dreamland: The Way Out of Juárez." "Dreamland" is a hallucination of deeply unsettling images and words, the latest from the University of Texas Press' challenging investigations into border issues. For pure reading fun, though, nothing beat "The Hunger Games" trilogy by Suzanne Collins, and best book by a Texas author was Debra Monroe's "On the Outskirts of Normal."

- Sarah Bird, author of 'How Perfect Is That' and the forthcoming 'The Gap Year'

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The Northlines

December 7, 2010 Tuesday

BJP's Protest rally in Doda

LENGTH: 247 words

Jammu, Nov 08 (TNI): A protest rally was organized and held in Doda by District General Swami Raj Sharma and Narinder Singh in continuation of serial protest rallies programme chalked out by the party against the utterances of Congress-NC coalition's Chief Minister Omar Abdullah in the assembly here today.

The protest rally was addressed by Swami Raj Sharma who proclaimed that any dilution of the state bonds with the rest of the country would be effected on their dead bodies only.

Any element organization or institution dreaming of distancing the state from the rest of the country is only diluting him and living in a state of day dreaming. Recalling the epochal agitation launched by Praja Parishad in 1952-53 under the leadership of Late Pt. Prem Nath Dogra which resulted in the abolition of entry permit system, Sharma paid tributes to the valiant martyrs who laid down their lives during the agitation and reaffirmed the commitment of the BJP and all other nationalist people in strengthening the bonds with the rest of the country.

He said the challenge before the nationalist and secular people was to do away with Article-370 of the constitution and thereby permanently bury the disintegrative proclivities of anti-national persons and forces.

Prominent among those who were present in the protest rally included Ishtiq Wani, Gajay Singh, **Manjit Kumar,** Kuldeep Singh, Varinder Singh, Amar Singh, Naveen Kotwal, Vijay Thakur, Kuldeep Singh, Rajinder Singh and besides others.

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Arts & Book Review

December 3, 2010
First Edition

The sun shines on a solar quest; CHASING THE SUN by Richard Cohen Simon & Schuster, £30, 682pp £27 from the Independent Bookshop: 08430 600 030

BYLINE: **Manjit Kumar**

SECTION: BOOKS; Pg. 28

LENGTH: 782 words

A Chinese-made portable solar-powered lamp and charger was the final object chosen by Neil MacGregor, director of the British Museum, in his A History of the World in 100 Objects. It was a choice that few would have predicted, but once its solar panel captures and stores the energy of eight hours of sunshine, this 21st-century lamp converts it into 100 hours of light to be used whenever and wherever needed. "The power of the Sun seems a good place to end this global history," said MacGregor, "because solar energy is a dream of the future that echoes the oldest and most universal of human myths, that of the life-giving Sun."

Richard Cohen has produced an encyclopaedia of a book that could almost serve as a companion to MacGregor's landmark series - an alternative history of the world told through humanity's relationship with a single object.

He begins with the myth of the Sun as the god Inti, of the tribes of Peru and northern Chile, who descended into the ocean every evening, swam back to the east, then reappeared, refreshed by his bath. The Hopi of Arizona claim that they made the Sun by throwing up a buckskin shield along with a fox's coat and a parrot's tail, to make the colours of sunrise and sunset.

"The Sun is 32,000 light years from the centre of its galaxy of a hundred billion stars, which it orbits at about 155 miles a second, taking about 200 million years to complete a revolution," reports Cohen. The Sun has been active for 4.6 billion years and a single particle of light, a photon, from its core takes 150,000 years to reach space. Every second, about five million metric tonnes of mass are converted into nuclear energy: equivalent to the detonation of 90,000 million one-megaton hydrogen bombs. The numbers are mind-boggling, but this constant blast of nuclear reactions pushes energy to the surface, releasing it as light and heat.

The Earth receives more of this energy in just 45 minutes than its inhabitants consume in a year. About 35 per cent is reflected back into space by clouds and the atmosphere absorbs another 19 per cent. This still leaves 12,000 times as much energy as used by all man-made devices.

Effectively harnessing the sun is not just a modern ambition. The Greeks in the third century BC used "burning mirrors" to focus sunlight on enemy warships. Archimedes, so legend has it, deployed such mirrors in 21BC to defend Syracuse from a blockading Roman fleet by burning the enemy's sails.

The Romans were the first to build greenhouses. In the sixth century, the Emperor Justinian passed a law protecting public and domestic sunrooms from the erection of buildings that obstructed light; 1,000 years later, Leonardo da Vinci proposed using a giant mirror as a commercial source of heat.

Like some latter-day Victorian species hunter who travels the globe collecting new specimens, Cohen spent eight years chasing the sun across 18 countries and six continents. He began with a climb to the top of Mount Fuji to watch the sunrise on the summer solstice and ended in a sunset viewed from a boat on Ganges at Varanasi.

Among other trips, Cohen recounts seeing an eclipse on the Antarctic ice. He visits the Arctic city of Tromso in Norway, which for ten weeks each year receives virtually no sunlight (a period the locals call "the dark times"), to investigate how we react to the loss of light.

Among Cohen's treasure-trove of solar miscellanea is the "sunspot cycle" in modern economics, the story of sundials and calendars from Julius Caesar to Pope Gregory VII, the introduction of daylight saving time in 1916 as a wartime economic measure, and a brief history of navigation and cartography. He shows how the Babylonians were the first to record the sun's movements in detail, while the Greeks went further, inquiring into its size, shape, and distance from the Earth.

Occasionally Cohen's passion for all things solar gets the better of him, as when he suggests that the lingams of Hindu temple domes are "purposely imitated in the design of nuclear-reactor cones, the latest tribute to the sun's potency". Yet he can be forgiven, as we learn how artists from the Renaissance to Hockney have depicted the Sun, or of Shakespeare's enthusiasm for suntans. We see why Galileo recorded his discovery of sunspots in code, why Matisse rushed out of his dying wife's bedroom, why Wagner hated the Sun and Mozart loved it.

All things come to an end, and Cohen devotes a chapter to the death of the Sun. As I read it I remembered the first part of a poem of Francis William Bourdillon: "The night has a thousand eyes,/ And the day but one;/ Yet the light of the bright world dies/ With the dying of the sun."

Manjit Kumar's 'Quantum' is published by Icon

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New Scientist

November 20, 2010

Abraca-dazzler

BYLINE: **Manjit Kumar**

SECTION: OPINION; No. 726

LENGTH: 517 words

HIGHLIGHT: Magicians and neuroscientists collaborate to bring us "neuromagic"

Magic helps neuroscientists understand the brain

Sleights of Mind: What the neuroscience of magic reveals about our everyday deceptions by Stephen L. Macknik, Susana Martinez-Conde and Sandra Blakeslee is a fascinating look at a new branch of cognitive research: "neuromagic"

Sleights of Mind: What the neuroscience of magic reveals about our everyday deceptions by Stephen L. Macknik, Susana Martinez-Conde and Sandra Blakeslee, Profile/Henry Holt and Co, £12.99/$26

Reviewed by **Manjit Kumar**

MAGIC, it mystifies and captivates us. We shake our heads in disbelief as coins are conjured out of thin air, as cards are mysteriously summoned from a pack, and as the magician's assistant vanishes before our eyes. Of course, there is no such thing as "magic", so how does magic work? It's a question that neuroscientists like Stephen Macknik and Susana Martinez-Conde are trying to answer. In the process they have conjured

up a new branch of cognitive research called neuromagic.

From misdirection and the magical practice of "forcing", to mirror neurons and synaptic plasticity, Sleights of Mind is a spellbinding mix of magic and science. The authors invite us to sip this heady potion as they show us how understanding the myriad ways in which the brain is deceived by magic may solve some of the mysteries surrounding how it works.

"Magic tricks fool us because humans have hard-wired processes of attention and awareness that are hackable," say the authors. Magicians use your mind's intrinsic properties against you. In a magical feat of their own, the authors persuaded magicians such as James Randi and Teller from the Las Vegas headline act Penn and Teller to deconstruct tricks so that Macknik and Martinez-Conde could later attempt to reconstruct what is going on inside your head "as you are suckered".

Magic, say the neuroscientists, could reveal how the brain functions in everyday situations such as shopping. However, it is a stretch to believe, as the authors do, that if you've bought an expensive item you never intended to buy, then you were probably a victim of the "illusion of choice", a technique magicians use to rob their dupes of genuine choice.

The magician toys with us when he appears to put a coin into his right hand, closes it, waves his left over it, and then opens the right. The coin, which we feel must still be there, has "vanished". He makes us experience the impossible by disrupting the expected relationship between a cause and its effect.

What we see, hear and feel is based on what we expect to see, hear and feel due to our experiences and memories. When these expectations are violated the brain takes more time to process data or our attention focuses on the violation. Success or failure for magicians relies on their skill in diverting our attention away from the method and towards the magical effect.

Great magicians, through countless hours of practice, manipulate our attention, memory and causal inferences, using a bewildering combination of visual, auditory and tactile methods. The greatest magic show on earth, though, is the one happening in your brain.

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NewScientist
New Scientist

November 6, 2010

BYLINE: **Manjit Kumar**

SECTION: OPINION; No. 716

LENGTH: 183 words

Little neutral ones

Neutrino by Frank Close is an informative guide to this ghostly particle

Ghost particle

Neutrino by Frank Close, Oxford University Press, £9.99/$18.95

Reviewed by **Manjit Kumar**

FOR a moment in the late 1920s, Niels Bohr considered the unthinkable: abandoning the notion of conservation of energy. He wasn't calling for its wholesale rejection, only that it be disregarded whenever a neutron decayed into a proton and an electron, as some energy appeared to go missing along the way.

Wolfgang Pauli, who was wont to damn poor ideas as "not even wrong", came up with a solution he called "a terrible thing" -; an unknown particle to account for the missing energy. Since it had to be electrically neutral with little or no mass, it was called the neutrino, the "little neutral one".

In this short and informative book, Frank Close recalls those who had the ingenuity and patience to catch and understand this elusive particle that barely interacts with other matter. Their successors are hunting neutrinos left over from the big bang, and no one knows what stories these relics will tell.

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THE TIMES
The Times (London)

November 4, 2010 Thursday
Edition 1;
National Edition

EVENTS;
The list

SECTION: EUREKA;FEATURES; Pg. 56

LENGTH: 439 words

Wild Oceans 3-D Science Museum, London SW7

Daily, various times £8/£6.25 concs

An IMAX film that considers the relationship between Man and the ocean. This underwater adventure, filmed off the coast of South Africa, documents how fish have been a staple diet and source of income for generations of people. It was the 2009 Earthwatch film of the year.

Eureka Live Wellcome Collection, London NW1

Nov 4, 7pm Free

Wellcome Collection and The Times invite you to join a panel of experts to discuss the Eureka 100 - our list of the most important people in British science and engineering. The panel will also debate the Government's October spending review and its implications for research, education and funding.

Exploring the Invisible: Art-Science Cafe Royal Institution, London W1

Nov 4, 7pm Free

An exchange of ideas between the artist Anne Brodie and the microbiologist Simon Park that explores ways of interacting with bioluminescent bacteria. Instead of using these micro-organisms as internal markers, the pair have used them as a light source in a "bioluminescent photographic booth", in which they captured portraits of eminent scientists.

Science and the Parliament 2010 Our Dynamic Earth, Edinburgh

Nov 10, 12.30pm Free

This annual event brings together MSPs, civil servants and Scottish scientists. The aim is to identify issues and policies that scientists would like to see incorporated in the manifestos of the leading political parties.

Soft but not Floppy: The Art of Science and the Science of Art UCL, London WC1

Nov 17, 4pm Free

Professor Steve Jones examines the interaction of art and science, drawing parallels from animal camouflage and behaviour.

Disease Invasion: Impacts on Biodiversity and Human Health ZSL, London NW1

Nov 18 and 19, 9am-5pm, £130

A joint Zoological Society of London and Royal Society symposium. The aim of the event is to discuss the transmission of infectious diseases from one species to another, which causes problems for humans and threatens wildlife conservation.

Passport to Parenthood: The Evidence and Ethics Behind Cross-border Reproductive Care Institute of Child Health, London WC1

Nov 24, 9.30am-5pm £120/£60 concs

The Progress Educational Trust annual conference looks at "fertility tourism" - the boom in couples travelling overseas for fertility treatment. The day will be spent examining all aspects of cross-border reproductive care.

Vote for the Greatest Lucasian Professor Foyles bookshop, Charing Cross Road, London WC2

Nov 24, 6.30pm Free

J. P. McEvoy, **Manjit Kumar** and Graham Farmelo debate the merits of three Cambridge physics professors: Stephen Hawking, Sir Isaac Newton and Paul Dirac.

LOAD-DATE: November 4, 2010

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newspaper

JOURNAL-CODE: TIM

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45 of 108 DOCUMENTS

New Scientist

October 30, 2010

BYLINE: Manjit Kumar

SECTION: OPINION; No. 715

LENGTH: 196 words

Bite-sized science

If you like your science light and entertaining then Chris Smith's The Naked Scientist will definitely appeal

Bare essentials

The Naked Scientist: The science of everyday life laid bare by Chris Smith, Little, Brown, £12.99

Reviewed by **Manjit Kumar**

IF YOU are not a fan of Jamie Oliver, aka the Naked Chef, then the title alone may be enough to put you off this book. But resist the temptation to judge it by its cover. This is science packaged as light entertainment, with flash-facts and bite-sized stories ranging from how fish help pollinate flowers to why booze makes us drunk. Among the more fascinating entries are a study that found that people are less likely to remember brands advertised during violent and sexually explicit programmes, and the possibility that eating curry could help ward off Alzheimer's.

The Naked Scientist is the alter ego of University of Cambridge virologist Chris Smith, who wants to "strip down science to the bare essentials and expose you to what it really is -; addictively enjoyable, interesting and occasionally a bit naughty". With Christmas looming, and in search of an audience, Smith bares just enough to pull it off.

LOAD-DATE: January 18, 2011

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Magazine

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46 of 108 DOCUMENTS

Kashmir Times

October 25, 2010 Monday

Bid to grab property: Six arrested for preparing fake EPIC card

BYLINE: KT NEWS SERVICE

LENGTH: 302 words

DATELINE: JAMMU

JAMMU, Oct 25: With the arrest of half-a-dozen persons including three employees of different departments from Janipur, police claimed to have foiled their attempt to grab the property of one person by preparing fake EPIC cards.

They were identified as Vijay Kumar Verma (employee of Geology and Mining department) son of Bhagwan Das of Janipur Arjun Nagar House number 130 at present New Plots, Sanjeev Chada (Shopkeeper and Property dealer) son of Bishwa Nath of Shant Nagar Janipur, Ajeet Kumar (employee of Municipal Corporation) son of Beli Ram of Jawahar Nagar Jammu, Shiv Kumar son of Hans Raj from Bikram Chowk Jammu, **Manjit Kumar** son of Rattan lal of Jawahar Nagar, New Plots and Bharat Bhushan alias Jagga, son of Khareti Lal of Shakti Nagar (stamp maker).

Police said that three fake EPICs cards in the name of Sita Ram, Avtar Krishan and Jung Prakash all sons of

Chuni Lal of 128-B Bakshi Nagar were fraudulently prepared by the accused and these were handed over to Joginder Pal son of Mangat Ram of Moori (Katra), Karan Singh son of Chamail Singh of Katra and Sardari Lal of Tej Ram of Dansal respectively by pasting their photographs on these fake EPICs cards.

As per police, the mastermind behind this plan were Deepak Kumar alasi Deepu son of Sansar Chand of Katra Moori, Rajesh Raina of Chinore, Sanjeev son of Vishwa Nath of Janipur 2/122 Shant Nagar.

They tried to grab the land property of Chuni Lal of 128-B Bakshi Nagar and executed fake sale deed of land belonging to said Chuni Lal by paying Rs 3, 50,000 to Vijay Kumar Verma.

On this a case FIR number 119 of 2010 under section 419, 420, 467 and 468 RPC has been registered at police station Janipur and investigation is going on, police added.

Police team was headed by Jai Paul Sharma Station House Officer (SHO) Police Station Janipur Jammu.

LOAD-DATE: December 5, 2011

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newspaper

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Independent Extra

October 18, 2010 Monday
First Edition

A lot of hot air from the sceptics; The Monday Book MERCHANTS OF DOUBT By Naomi Oreskes & Erik M Conway BLOOMSBURY, £25 Order for £22.50 from the Independent Bookshop: 08430 600 030

BYLINE: **MANJIT KUMAR**

SECTION: VIEWSPAPER; Pg. 14

LENGTH: 374 words

Public scepticism about climate change is on the rise. The shift is due in part to the publication of the hacked emails of the University of East Anglia's "climategate" scientists. Now climatologists have to live with the fact that most people simply don't trust them. Merchants of Doubt, by two historians of science, may help restore some trust by showing that science is rarely black and white, and how its shades of grey have sometimes

been distorted by a few willing hands.

Writing before "climategate", Naomi Oreskes and Erik Conway believe that "We all need a better understanding of what science really is... and how to separate it from the garbage." They tell the story of how for half a century, a small group of scientists in America collaborated with think-tanks and corporations in campaigns to discredit scientific research by creating doubt and manipulating debate.

Manufacturing doubt as an effective corporate strategy was first developed by the American tobacco industry. Determined to stop any government regulation in the face of scientific evidence linking tobacco to lung cancer, the cigarette-makers created the Council for Tobacco Research to discredit the scientists and dispute their findings. "Doubt is our product," boasted a now infamous 1969 industry memo. Doubt would shield the tobacco industry from litigation and regulation for decades to come.

The so-called "Tobacco Strategy" was used to "maintain the controversy" by promoting claims contrary to research. The peddlers of doubt insisted that scientists were wrong about the risks of Ronald Reagan's Strategic Defence Initiative, and that acid rain was caused by volcanoes. They would dismiss global warming by claiming, in turn, that there was none; if there was, it was just natural variation; finally, it didn't matter because humans would adapt. Aided by a complicit media, these claims generated the illusion of genuine scientific debate when there was none at all.

No scientific conclusion can ever be proven with certainty, but it is no more a "belief" to say that the Earth is heating up than to say that continents move or that germs cause disease. Oreskes and Conway warn that, "without some degree of trust in our designated experts we are paralyzed".

LOAD-DATE: October 17, 2010

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newspaper

JOURNAL-CODE: IE

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The Guardian (London) - Final Edition

October 16, 2010 Saturday

Review: NON-FICTION: Now and then: Manjit Kumar examines Roger Penrose's theory of the big bang: Cycles of Time: An Extraordinary New

View of the Universe by Roger Penrose 288pp, Bodley Head, £25

BYLINE: Manjit Kumar

SECTION: GUARDIAN REVIEW PAGES; Pg. 8

LENGTH: 925 words

When I first encountered the work of MC Escher, I couldn't understand how he managed to depict the seemingly impossible. I was nine, and the two pieces that puzzled me were Waterfall and Ascending and Descending. In the first, water at the bottom of a waterfall flows along a channel back to the top without defying gravity in a never-ending cycle. The second is even more striking, with one set of monks climbing an endless staircase while another group walk down it without either ever getting any higher or lower. Years later I learnt that both works were inspired by Roger Penrose.

As a student in 1954, Penrose was attending a conference in Amsterdam when by chance he came across an exhibition of Escher's work. Soon he was trying to conjure up impossible figures of his own and discovered the tri-bar - a triangle that looks like a real, solid three-dimensional object, but isn't. Together with his father, a physicist and mathematician, Penrose went on to design a staircase that simultaneously loops up and down. An article followed and a copy was sent to Escher. Completing a cyclical flow of creativity, the Dutch master of geometrical illusions was inspired to produce his two masterpieces.

Doing what most find impossible has long been Penrose's stock in trade in mathematics and physics, even when it comes to publishing. His previous book, The Road to Reality, was a 1,049-page bestseller, although it was mostly a textbook. Penrose doesn't do "popular", as he peppers his books with equation after equation in defiance of the publishing maxim that each one cuts sales in half. By that reckoning Cycles of Time will have about four readers, though it's probably destined to be another bestseller. As Penrose puts forward his truly Extraordinary New View of the Universe, that the big bang is both the end of one aeon and the beginning of another in an Escheresque endless cycling of time, he outlines the prevailing orthodoxy about the origins of the cosmos.

In the late 20s it was discovered that the light from distant galaxies was stretched towards the red end of the visible spectrum. This redshift was found to be greater the further away the galaxy was, and was accepted as evidence of an expanding universe. This inevitably led theorists to extrapolate backwards to the big bang - the moment of its birth some 13.7bn years ago, when space and time exploded into being out of a single point, infinitely hot and dense, called a singularity. That at least was the theory, with little more to back it up until 1964, when two American scientists discovered "cosmic background radiation" - the faint echo of the big bang. In the decades since, further evidence has accumulated and theoretical refinements made to accommodate it. Yet in recent years a few physicists have challenged the big bang model by daring to ask and answer questions such as: was the big bang the beginning of the universe?

Traditionally such questions have been dismissed as meaningless - space and time were created at the big bang; there simply was no "before". Although it's possible to work out in incredible detail what happened all the way back to within a fraction of a second of the big bang, at the moment itself the theory of general relativity breaks down, or as Penrose puts it: "Einstein's equations (and physics as a whole, as we know it) simply 'give up' at the singularity." However, he believes we should not conclude from this that the big bang was the beginning of the universe.

Acknowledging that he's not the first to think such heretical thoughts, Penrose looks at earlier "pre-big bang proposals". Finding them "fanciful", Penrose looked anew at the big bang, because of an unsolved mystery at its heart involving the Second Law of Thermodynamics. One of the most fundamental in all of physics, it simply says that the amount of disorder, something that physicists label "entropy", increases with the passage of time. Herein lies the mystery for Penrose. The instant after the big bang, "a wildly hot violent event", must have been one of maximum entropy. How can entropy therefore increase? Penrose thinks he

has the answer; there must be a pre-big bang era that ensures that entropy is low at the birth of the universe. And here's how.

In what Penrose calls "conformal cyclic cosmology", the beginning and the end of the universe are in effect the same, since these two phases of its evolution contain only massless particles. Between now and a far off distant future, everything from the tiniest particles to biggest galaxies will have been eaten by black holes. They in turn lose energy in the form of massless particles and slowly disappear. As one black hole after another vanishes the universe loses "information". Since information is linked to entropy, the entropy of the universe decreases with the demise of each black hole.

The strangest thing about massless particles is that for them there is no such thing as time. There is no past or present, only "now", and it stretches for all eternity - but since there is no tick of the clock, what eternity? With some mind-numbing maths, Penrose argues that as time ends in the era of massless particles, the fate of our universe can actually be reinterpreted as the big bang of a new one: "Our universe is what I call an aeon in an endless sequence of aeons." Escher would have approved.

Manjit Kumar's Quantum: Einstein, Bohr and the Great Debate about the Nature of Reality is published by Icon. To order Cycles of Time for £19 with free UK p&p call Guardian book service on 0330 333 6846.

LOAD-DATE: October 17, 2010

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newspaper

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NewScientist
New Scientist

October 16, 2010

Captain Quantum

SECTION: OPINION; No. 713

LENGTH: 526 words

HIGHLIGHT: Who better than a superhero to tell the story of quantum theory and its pioneers?

Jetpacks failed to live up to the hype, but what we got instead was better

Quantum mechanics: a tale fit for a superhero

James Kakalios takes an original and highly readable approach to his subject in The Amazing Story of Quantum Mechanics

The Amazing Story of Quantum Mechanics: A math-free exploration of the science that made our world by James Kakalios, Duckworth/Gotham, £12/$26

Reviewed by **Manjit Kumar**

"EXTRAVAGANT fiction today, cold fact tomorrow" was the bold claim of Amazing Stories, the first of the American magazines devoted to science fiction. Beginning in the 1930s, these sci-fi pulps and comics envisaged that by the year 2000 we would be living in a world with domed underwater cities and travelling in flying cars and by jetpacks. Instead we have mobile phones, laptops and DVDs.

The predictions were off, says James Kakalios, because implicit in the promise of flying cars is the availability of lightweight power supplies capable of producing enormous quantities of energy. In fact, the capacity of batteries to act as reservoirs of energy is limited by the chemical and electrical properties of atoms -; and we cannot change the physics of atoms.

This is Kakalios's cue to explain the key concepts of quantum mechanics and show how these ideas account for the properties of metals, insulators and semiconductors -; and how they underlie the magnetic properties of atoms that let us store vast amounts of data on computer hard drives and build MRI scanners that can see inside the human body.

The physicists who developed quantum theory and the fans of sci-fi pulps had one thing in common, says Kakalios, and that was a willingness to suspend disbelief as they accepted the impossible as real. Three such quantum facts were: light is an electromagnetic wave that is actually composed of chunks of energy; matter is composed of particles that exhibit a wave-like nature; and both light and matter have a property called spin that can only have certain values.

Having provided the reader with these counter-intuitive notions, Kakalios looks at the problems they solved. To help explain Planck's discovery of the quantum, the photoelectric effect, the quantum atom, wave-particle duality, Schrödinger's wave equation, the probabilistic interpretation of the wave function, the uncertainty principle and more besides, comic-loving Kakalios enlists a legion of superheroes, from Superman to Dr Manhattan.

In addition to his bright-blue appearance, Jon Osterman aka Dr Manhattan, appears to have gained control of his quantum-mechanical wave function. This, the starting point for Kakalios's highly readable presentation of quantum ideas, gives him the ability to alter his size at will, to teleport himself and others from one place to another, and to experience the past, present and future simultaneously.

The scientist as a world-changing hero is an apt description for the physicists who developed quantum mechanics, Kakalios believes. He has a point. The discoveries by a handful of physicists back in the 1920s and 1930s of the rules that govern how atoms interact with light and each other continue to shape and change the world we live in.

LOAD-DATE: January 18, 2011

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Magazine

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The Sunday Telegraph (London)

October 10, 2010
Edition 1;
National Edition

History Simon Sebag Montefiore on the early Seventies

SECTION: SEVEN;FEATURES; Pg. 27

LENGTH: 25 words

History Simon Sebag Montefiore on the early Seventies p 28

Fiction Philip Roth and Colm Tóibín p 29

Biography **Manjit Kumar** on Galileo p 30

Paperbacks p 31

LOAD-DATE: October 10, 2010

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newspaper

JOURNAL-CODE: STL

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51 of 108 DOCUMENTS

The Sunday Telegraph (London)

October 10, 2010
Edition 1;
National Edition

HISTORY;
Manjit Kumar hails a lucid account of Galileo's struggles with both celestial and temporal bodies

BYLINE: Manjit Kumar

SECTION: SEVEN;FEATURES; Pg. 30

LENGTH: 694 words

Galileo: Watcher of the Skies

By David Wootton

YALE, £25, 354pp

It is a little known fact that in 1532 Copernicus's sun-centred solar system was presented to an audience in the Vatican.Given the storm that was to come, it is barely believable that the then pope, Leo X, afterwards sent a note of encouragement to Copernicus as the Polish priest laboured to finish his book. On the Revolutions of the Heavenly Spheres was published in 1543 and Copernicus, so the story goes, held the first copy to come off the press just hours before he died. As long as his heliocentric model was presented as hypothetical, the Vatican was unconcerned by Copernicanism. One man changed all that.

Born in February 1564, Galileo Galilei initially set out to be a doctor before switching to mathematics - much to the displeasure of his father. It is unlikely that, according to the legend, he ever dropped balls from the leaning tower of Pisa as he investigated the motion of falling bodies and discovered that all objects fall at the same rate, contradicting what everybody believed since Aristotle.

When, in 1609, he learnt of the invention of the telescope by a Dutch spectacle maker, Galileo quickly constructed his own. Within a matter of months he had transformed it from a toy into an instrument of scientific discovery and he found that the Milky Way was not a streak across the sky but a multitude of stars; that the Moon had mountains and valleys; and he observed the phases of Venus and the spots on the Sun.

'For Galileo, seeing was believing,' says the historian DavidWootton. Yet he argues persuasively in this well researched, intellectual biography that Galileo was a Copernican long before his discovery of the moons of Jupiter proved that not all heavenly bodies revolved around the Earth. In March 1610, Galileo published his discoveries in the aptly titled book, The Starry Messenger.All 550 copies were sold within a week and soon the 46 yearold was Europe's most celebrated natural philosopher.

Faced with the Reformation, the Catholic Church was increasingly less tolerant of dissent. In 1616, Galileo went to Rome after a letter he wrote was brought to the attention of the Holy Office of the Inquisition. In it Galileo argued that although the Bible is the word of God, it is adapted to human capacities. Nature, however, is 'inexorable and immutable'. So, when it comes to certain questions, direct knowledge of nature must always take priority over whatever the Bible may have to say on the subject.And the answer to one of

those questions was that it is the Earth that moves around the Sun and not the other way round.

Wootton does a good job of untangling who said what to whom and when in Galileo's dealings with the Inquisition.To cut a long story short, Galileo was given a formal warning that forbade him from holding, teaching or defending Copernicanism.To complicate matters, around the same time, in March 1616, the Vatican banned all books that held Copernicanism to be true.

Then, in a surprising turn of events, in 1623 Maffeo Barberini, an old friend of Galileo's, was elected pope. Urban VIII allowed Galileo to reenter the somewhat muted debate on Copernicanism. Before long, argues Wootton, intellectual ambition and vanity led Galileo to stake everything on facing down his opponents in his book Dialogue on the Two Chief World Systems. In April 1633, Galileo was summoned before the Inquisition and held firm that, although in the Dialogue he discussed Copernicanism, he did not defend it, and he denied any knowledge of the injunction of 1616 not even to do that.

It was at this point that the prosecutor played his trump card - a report that Galileo was guilty in an earlier book of denying transubstantiation. It was a charge that, if proven, implied that Galileo was not a Catholic but a Protestant.While admitting to piling 'conjecture upon conjecture',Wootton goes further than any enforcer of the Inquisition and accuses Galileo of not being a Christian at all.

Galileo died in 1642, a prisoner of the Inquisition. In 1992, the Catholic Church apologised for its treatment of the secular saint. Only God knows what Leo X would have made of it all.

LOAD-DATE: October 10, 2010

LANGUAGE: ENGLISH

GRAPHIC: Galileo Ambition and vanity led him into trouble
THE GALLERY COLLECTION/CORBIS

PUBLICATION-TYPE: Newspaper

JOURNAL-CODE: STL

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Edmonton Journal (Alberta)

September 26, 2010 Sunday
Final Edition

Bestsellers

BYLINE: Edmonton Journal

SECTION: BOOKS & ARTS; Pg. B2

LENGTH: 327 words

EDMONTON TOP 10

Compiled by Greenwoods' Bookshoppe and Audreys Books. Bracketed figures: last week's position. Asterisks: Alberta authors.

FICTION

1. (4) The Girl with the Dragon Tattoo -- Stieg Larsson

2. (6) The Girl Who Kicked the Hornet's Nest -- Stieg Larsson

3. (-) Zero History -- William Gibson

4. (5) Freedom -- Jonathan Franzen

5. (7) Sanctuary Line -- Jane Urquhart

6. (9) The Help -- Kathryn Stockett

7. (-) The Beauty of Humanity Movement -- Camilla Gibb

8. (-) Pieces of Eight -- John Drake

9. (-) Ape House -- Sara Gruen

10. (-) The Good Daughters -- Joyce Maynard

NON-FICTION

1. (-) The Legacy -- David Suzuki

2. (-) Ethical Oil -- Ezra Levant*

3. (2) Quinoa 365 -- Patricia Green* and Carolyn Hemming

4. (1) The Grand Design -- Stephen Hawking and Leonard Mlodinow

5. (-) A Journey -- Tony Blair

6. (-) Three Cups of Tea -- Greg Mortenson

7. (-) The Tiger -- John Vaillant

8. (-) The Book of Awesome -- Neil Pasricha

9. (-) What Color is Your Parachute? for Retirement -- John Nelson and Richard Bolles

10. (-) The Art of Choosing -- Sheena Iyengar

NATIONAL TOP 10

Compiled by Maclean's magazine, from data provided by independent bookstores.

FICTION

1. (1) Freedom -- Jonathan Franzen

2. (5) Room -- Emma Donoghue

3. (2) The Girl Who Kicked the Hornet's Nest -- Stieg Larsson

4. (3) Sanctuary Line -- Jane Urquhart

5. (-) Fauna -- Alissa York*

6. (-) Bad Boy -- Peter Robinson

7. (4) The Beauty of Humanity Movement -- Camilla Gibb

8. (10) The Elephant's Journey -- Jose Saramago

9. (6) The Help -- Kathryn Stockett

10. (8) The Thousand Autumns of Jacob de Zoet -- David Mitchell

NON-FICTION

1. (1) A Journey -- Tony Blair

2. (2) The Tiger -- John Vaillant

3. (-) The Grand Design -- Stephen Hawking and Leonard Mlodinow

4. (3) The Power -- Rhonda Byrne

5. (5) Women, Food and God -- Geneen Roth

6. (-) The Balfour Declaration -- Jonathan Schneer

7. (6) Ill Fares the Land -- Tony Judt

8. (8) Hitch-22 -- Christopher Hitchens

9. (4) On the Farm -- Stevie Cameron

10. (-) Quantum -- **Manjit Kumar**

LOAD-DATE: September 26, 2010

LANGUAGE: ENGLISH

DOCUMENT-TYPE: News

PUBLICATION-TYPE: Newspaper

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THE TIMES
The Times (London)

September 18, 2010 Saturday
Edition 1;
National Edition

Arabian heights; nonfiction

BYLINE: Manjit Kumar

SECTION: SATURDAY REVIEW;FEATURES; Pg. 10

LENGTH: 723 words

Pathfinders: The Golden Age of Arabic Science by Jim Al-Khalili Allen Lane, £25 £22.50; 336pp Stockholm, December 1979. Ten men wait to receive their Nobel prizes from the King of Sweden. Nine are wearing white-tie and tails. Abdus Salam, a devout Muslim, stands out in a turban and traditional Punjabi clothes. The Pakistani physicist is being honoured for his part in formulating the electroweak theory that unites electromagnetism and the weak nuclear force. "There is no doubt in my mind that his work places him as the greatest physicist of the Islamic world for a thousand years," says Jim Al-Khalili, the Iraqi-born physicist-cum-writer.

For many non-Muslims, the term "Islam" evokes a "negative stereotype that contrasts with our Western, secular, rational, tolerant and enlightened society", says Al-Khalili. This captivating book is his timely reminder of the debt owed by the West to the intellectual achievements of Arab, Persian and Muslim scholars, a thousand years before Salam got his Nobel prize, when the roles were reversed.

Al-Khalili has long wanted to tell the tale of the "golden age of Arabic science" that began in the late 8th century and lasted for more than 500 years. Since there is no such thing as "Jewish science" or "Christian science", Al-Khalili explains that by "Arabic science" he means the remarkable body of work produced in Arabic, the lingua franca of science and much else as Europe slumbered through its Dark Ages.

The Koran was the first book written in Arabic, and much effort was spent studying and interpreting it. The wealth and power ofthe growing Islamic empire made it possible for the Abbasid caliphs to promote an ever-growing sphere of academic inquiry that had been lost since the glory days of Greek Alexandria. Advances in maths, astronomy, physics, chemistry, medicine and the flourishing of philosophy that took place, first in Baghdad and then across the Islamic world, all have their origins in what historians call the translation movement.

Thanks to the practical benefits it brought in finance, agriculture, engineering and health, the translation movement was a 200-year process during which much of the wisdom of the Greeks, Persians and Indians was translated into Arabic. These translations helped to produce a culture of scholarship that became self-sustaining and formed part of a wider quest for knowledge that evolved into a tradition of intellectual exploration that sparked the beginning of an age of scientific progress. A 9th-century caliph of Baghdad created the House of Wisdom, a centre of learning that some say was home to 400,000 books - at a time

when the best European libraries held no more than a few dozen.

In 711, Muslims had crossed into Spain and so began almost eight centuries of Islamic influence in Andalusia. Just as Baghdad had been the epicentre of the translation movement from Greek into Arabic, so cities such as Córdoba and Toledo became the centres of translation of the great Arabic texts into Latin. One of the first scholars to study these was Gerbert d'Aurillac, a 10th-century French monk. He would later become the first Christian scholar to carry Arabic learning across the Pyrenees. It seems fitting that the man who would later become Pope Sylvester II introduced Christian Europe to the science of the Islamic Empire.

Al-Khalili argues that the scientific revolution could not have taken place without the advances of the medieval Islamic world. Ibn al-Haytham dominated the field of optics long before Newton and used the scientific method 600 years before Francis Bacon even thought about it. Abdus Salam, who died in 1996, named some of the giants of Arabic science in his Nobel lecture: al-Biruni, al-Razi, Ibn Sina, Jabir, and al-Khwarizmi. If you want to know what these men did, read this fascinating book and let Al-Khalili tell you their stories.

"We should not be ashamed to recognise truth and assimilate it, from whatever quarter it may reach us, even though it may come from earlier generations and foreign peoples," wrote Ya'qub ibn Ishaq al-Kindi, one of the great polymaths of the "golden age". "For the seeker after truth, there is nothing of more value than truth itself; it never cheapens or debases the seeker, but ennobles and elevates him."

LOAD-DATE: September 20, 2010

LANGUAGE: ENGLISH

GRAPHIC: leading light Ibn al-Haytham dominated the field of optics

PUBLICATION-TYPE: Newspaper

JOURNAL-CODE: TIM

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Arts & Book Review

September 10, 2010
First Edition

Theories of everything;
Stephen Hawking's new book dumps divine design in favour of spontaneous creation. Manjit Kumar asks if cosmic science has now written its last word

BYLINE: Manjit Kumar

SECTION: BOOKS; Pg. 22

LENGTH: 1631 words

God is dead," declared Friedrich Nietzsche, but few listened or cared. "It is not necessary to invoke God to light the blue touch paper and set the universe going," announced Stephen Hawking last week, and it was picked up by the world's media. For over 20 years earlier, the world's most famous scientist had ended his phenomenal bestseller A Brief History of Time with the arresting conclusion that "If we discover a complete theory, it would be the ultimate triumph of human reason - for then we should know the mind of God."

Why is there something rather than nothing? Why do we exist? Why this particular set of laws and not some other? It is these "ultimate questions of life" that Hawking's now sets out to answer, with the help of the American physicist and science writer Leonard Mlodinow, in his fascinating new book The Grand Design (Bantam, £18.99). Philosophers have traditionally tackled such questions, while most physicists have stayed well clear from addressing the "why" of things and concentrated instead on the "how".

Not any more. "To understand the universe at the deepest level," says Hawking, "we need to know not only how the universe behaves, but why." He believes that "philosophy is dead" because it failed to keep up with the latest developments, especially in physics.

For it is possible to answer these questions purely within the realm of science and without resorting to God. And the answers hinge on a candidate for a theory of everything called M-theory, "if it indeed exists", the authors admit. Unfortunately, no one seems to know what "M" stands for; it could be "master", "miracle" or "mystery".

The story of M-theory could be said to begin with the desire of physicists to unify and simplify. Just as ice, water and steam are different manifestations of water, in 1864 James Clerk Maxwell showed that electricity and magnetism were likewise different manifestations of the same underlying phenomenon - electromagnetism. He managed to encapsulate the disparate the behaviour of electricity and magnetism into a set of four elegant mathematical equations. Using these equations, Maxwell was able to make the startling prediction that electromagnetic waves travelled at the speed of light, approximately 670 million miles per hour. Light was a form of electromagnetic radiation. Maxwell's unification of electricity, magnetism and light was the crowning achievement of 19th-century physics.

In the 20th century, to go with gravity and electromagnetism, physicists discovered two new forces - the weak, which is responsible for radioactivity, and the strong that binds together, for example, the nucleus of an atom. They believed that these four forces, which appeared so different, would be reunited a single all-encompassing theory of everything.

With exception of general relativity, Einstein's theory of gravity, it's possible to "quantise" the other three forces, since quantum mechanics deals with the atomic and sub-atomic domain. In effect, we have three trains running on the same-sized track.

Unfortunately, Einstein's gravity train was running on a completely incompatible track. Yet the impulse for unity and simplicity is so strong that theorists have pursued a quantum theory of gravity, without success, for decades. Then in the 1980s there appeared a new theory that looked promising - superstrings.

The theory assumes that all observed particles are different manifestations of the same fundamental entity. According to the superstring idea, all particles previously thought off as little points are in fact not points at all but basically little oscillating bits of "string" which move through space. The different levels of "vibration" of these strings correspond to the different particles.

Superstrings vibrate in 10 dimensions. But we don't notice these extra dimensions because they are curled

up into a space that's infinitesimally small. Alas, it was discovered that there were at least five different string theories and millions of ways the extra dimensions could be curled up - an embarrassment of riches for those who hoped that string theory was the longed for theory of everything.

As others despaired, the American physicist Ed Witten led the way, beginning in the mid-1990s, in showing that the different string theories and a theory called "supergravity" were all just different approximations to a more fundamental theory: M-theory.

"M-theory is not a theory in the usual sense," admits Hawking. "It is a whole family of different theories, each of which is a good description of observations only in some range of physical situations. It is a bit like a map." Faithfully to map the entire earth, one has to use a collection of maps, each of which covers a limited region. The maps overlap each other, and where they do, they show the same landscape.

M-theory needs 11 space-time dimensions and contains not just vibrating strings but other objects that are impossible to visualise. The extra space dimensions can be curled up in a mind-blowing 10 to the 500th different ways, each leading to a universe with its own laws. To get an idea how many that is, Hawking and Mlodinow ask the reader to imagine a being capable of scanning each of those universes in just one millisecond and who started working on it at the Big Bang. Today that being would have only have scanned just 10 to the 20th of them.

This plethora of universes, the multiverse, explains what appears to be the mystery behind the remark

able coincidences that have fine-tuned natural laws to make our universe habitable for us. With so many universes, it's a lot less remarkable that there is at least one in which conditions are Goldilocks-like: just right to have given rise to us, since we exist it gas to be this one. This is the anthrophic principle that effectively says that things are the way they are because they were the way they were. From here, Hawking goes on to argue that "Because there is a law like gravity, the universe can and will create itself from nothing."

"'Think of an expanding universe as a surface of a bubble," writes Hawking. "Our picture of the spontaneous quantum creation of the universe is then a bit like the formation of bubbles of steam in boiling water. Many tiny bubbles appear, and then disappear again. These represent mini-universes that expand but collapse again while still of microscopic size. They represent possible alternative universes, but they are not of much interest since they do not last long enough to develop galaxies and stars, let alone intelligent life. A few of the little bubbles will grow long enough so that they will be safe from recollapse. They will continue to expand at an ever-increasing rate and will form the bubbles of steam we are able to see. These correspond to universes that start off expanding at an ever-increasing rate."

Spontaneous creation is the reason there is something rather than nothing; why the universe exists, why we exist. God is surplus to Hawking's requirements.

Why are the fundamental laws as they are? The ultimate theory must be consistent and must predict finite results for quantities that we can measure. There must be a law like gravity and, for a theory of gravity to predict finite quantities, the theory must have what is called "supersymmetry" between the forces of nature and the matter on which they act. "If the theory is confirmed by observation," says Hawking, "it will be the successful conclusion of a search going back more than 3000 years."

"Yet in the history of science," he admits, "we have discovered a sequence of better and better theories or models, from Plato to the classical theory of Newton to modern quantum theories. It is natural to ask: Will this sequence eventually reach an end point, an ultimate theory of the universe, that will include all forces and predict every observation we can make, or will we continue forever finding better theories, but never one that cannot be improved upon?"

Though Hawking is probably being rhetorical, Russell Stannard, a former professor of physics at the Open University, looks at the unanswered questions of modern physics in his book The End of Discovery (Oxford, £14.99). Stannard believes that eventually, but he doesn't know when, fundamental science will reach the limit of what it can explain. On that day, the scientific age, like the stone age and the iron age before it, will come to an end. He believes that not only technological limits, but maybe humanity will have reached the

limits if its mental capacities to unravel the nature and workings of reality.

Stannard takes readers on a tour of some of the deepest questions facing science: questions to do with consciousness, free will, the nature of space, time, and matter. He covers much of the same terrriority as Hawking and Mlodinow, and points out that to understand the subatomic world, scientists depend of particle accelerators; but to understand the very smallest units of nature, it has been calculated that we would need an accelerator the size of a galaxy.

In A Brief History of Time, Hawking said that a scientific theory "may originally be put forward for aesthetic or metaphysical reasons, but the real test is whether it makes predictions that agree with observations". As they have waited for the next generation of particle accelerators and experiments, the research of physicists from superstrings to quantum cosmology has had a tendency to take on a metaphysical character in recent decades.

So maybe philosophy isn't as dead as Stephen Hawking thinks. For those having a difficult time wrapping their head around "spontaneous creation", he has this tip: "If you like, you can call the laws of science 'God'."

Manjit Kumar's 'Quantum: Einstein, Bohr and the great debate about the nature of reality' is published by Icon

LOAD-DATE: September 9, 2010

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newspaper

JOURNAL-CODE: TR

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The Daily Telegraph

The Daily Telegraph (London)

September 7, 2010 Tuesday
Edition 1;
National Edition

There's a big bang in physics books

BYLINE: Tom Chivers

SECTION: FEATURES; Pg. 27

LENGTH: 646 words

The universe is expanding at an ever-accelerating rate, yet we still don't know what much of it is made of. If I had to guess, I'd say that most of it consists of books telling us that the universe is expanding at an ever-accelerating rate. The soaring popularity of popular physics books is a publishing phenomenon.

Traditionally, evolutionary biology has received most attention from publishers. As the philosopher and neuroscientist Daniel Dennett says, no area of science has been so well served by its writers: Richard Dawkins, Stephen Jay Gould and John Maynard Smith are particularly fine examples.

But since Dennett wrote that in 1995, evolutionary theory has been fighting for shelf space, as quantum physics and relativity mount a comeback. The past few weeks have seen Stephen Hawking's new book, The Grand Design, move from the books pages to the front pages with its provocative argument that physicists do not need a creator to explain the universe's existence. But a reader could equally well pick up We Need to Talk about Kelvin by Marcus Chown; In Search of the Multiverse by John Gribbin; Quantum by **Manjit Kumar;** Void by Frank Close; and dozens more.

"There's a real interest in science books at the moment," says Stuart Clark, author of The Universe (part of the "Big Question" series). And it's not as if they're light reading. Clark's own book asks what stars are made from, whether there are alternative universes, what the fate of the universe will be, and whether, à la Hawking, there is cosmological evidence for the existence of God.

Marcus Chown agrees that such science is becoming mainstream: another of his books, Quantum Theory Cannot Hurt You, sold 60,000 copies. "I thought the words 'quantum theory' would put people off, but they appear to think: 'I've heard of that. I ought to find out what it's about.' Popular science is a mature part of literature."

It's not just literature that has seen a flourishing of interest. This year, popular physics has been dominated by the TV series Wonders of the Solar System, presented by Professor Brian Cox. It has given physics, in the form of astronomy and cosmology, the box seat in the scientific mainstream. Clark says it's not just down to the former D:Ream keyboard player, though: "Cox realises science is inherently interesting, that you don't have to bust a gut with hyperbole and CGI to keep the public's interest."

The first episode of Wonders pulled in 2.8 million viewers and created a huge buzz online. As Chown says, "what was striking was how many non-scientists on Twitter absolutely loved it".

But as the sales figures suggest, interest has been building for a few years. One of the biggest sellers, Simon Singh's 2004 book Big Bang, was also one of the first - following the granddaddy of the genre, Hawking's A Brief History of Time.

The book is now more than 20 years old - but, says Chown, it changed everything. "Ten million copies sold and 237 weeks on the bestseller list. There have been popular science writers before - Carl Sagan, Isaac Asimov. But I don't believe there were popular science sections in bookshops before Hawking."

Whatever the reason, the explosion of interest is overdue. Physics - the stuff of the impossibly huge and the unimaginably tiny - shouldn't need a reason to be popular beyond its own incredible subject matter.

Open these books and you'll find out more about how the universe began and what it is made of; why planets orbit stars and why stars glow. You'll discover the weird stuff that goes on at quantum level - particles that are in two places at the same time and that seem to know if you're watching them. You'll learn why the universe had to be how it is, since we're here to talk about it. It's a chance to dip your toe in the greatest pool of learning in human history - and a section in Waterstone's is the very least that it deserves.

Tom Chivers

LOAD-DATE: September 7, 2010

LANGUAGE: ENGLISH

GRAPHIC: 'Science is inherently interesting': TV presenter Prof Brian Cox
BBC

PUBLICATION-TYPE: Newspaper

JOURNAL-CODE: DTL

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The Toronto Star

August 9, 2010 Monday

Book Smarts;
From mysteries to histories, reports on what the city's top minds are reading this summer

SECTION: NEWS; Pg. A3

LENGTH: 1633 words

It's the height of summer and, for many of us, the time to settle into a Muskoka chair with a good book and a cool drink.

The Star wondered what the city's top scientists and scholars read when they aren't in their labs, at their computers or writing manuscripts.

So we asked seven bright minds to tell us what books they are enjoying while relaxing in their backyard or lounging by the lake.

It's a lively list that includes everything from Agatha Christie to the short stories of Russian writer and adventurer Alexander Kuprin.

Maybe you'll find something here to add to your reading list.

RON DEIBERT

Director of the Citizen Lab at the University of Toronto's Munk School of Global Affairs

In April, Deibert and his team of computer security experts announced they had cracked a massive cyber-espionage ring that had infiltrated the Indian government. Their report made front-page news around the world.

What he recommends:

The Forever War by Dexter Filkins. "A hauntingly realistic account of the Afghanistan and Iraqi conflicts from a 'grounded' perspective. Considering that Canada has committed the lives of not only its armed forces to the Afghanistan security mission, but countless individuals working for humanitarian organizations as well, this book should be considered a civic responsibility. I could not put it down, even when it made me squirm."

What he is reading:

The Men Who Stare at Goats by Jon Ronson. "The book is much different than the movie, more of an investigative inquiry into the U.S. military's exploration of the paranormal. I recommend it for two reasons: First, it is very funny and after reading Dexter Filkins' Forever War everyone will need a laugh. Second, and more substantively, very few people understand the extent to which the manipulation of ideas is part of standard military doctrine. We tend to think of propaganda as something quaint from the Cold War or World War II and largely obsolete in today's world.

Nothing could be further from the truth.

Although not called 'propaganda' any more, the U.S. military invests billions of dollars in 'psychological operations' (PSYOPS), ranging from the blasting of heavy metal music over loudspeakers to sleep deprivation to secret publication of blogs that spread views favourable to U.S. strategic interests.

Very few people understand the full extent of the 'war of ideas.' This book is a fun introduction."

JOHN POLANYI

Professor of chemistry, University of Toronto

Polanyi shared the 1986 Nobel Prize in Chemistry for pioneering reaction dynamics, a new field of research in chemistry that has helped scientists understand how chemical reactions take place.

What he recommends:

The Age of Wonder: How the Romantic Generation Discovered the Terror and Beauty of Science by Richard Holmes. "Surely the best book ever written about the band of scientists who - with their sailing ships, telescopes, balloons and near-lethal gases - laid the groundwork for our age of science, two centuries ago in the early 1800s; every one a passionate human being."

What he is reading:

The Strangest Man: The Hidden Life of Paul Dirac, Quantum Genius by Graham Farmelo. "It succeeds in the impossible task of bringing to life the bloodless figure of Paul Dirac, one of the founders of modern physics, a genius admired by Albert Einstein and shunned by dinner companions. It, too, opens up new worlds. You don't have to have studied particle physics to enjoy it; my (portrait painter) wife is reading it for the second time."

His seasonal preference:

"I read abandoned books in summer evenings, latterly Agatha Christie (Murder In The Mews) ... and, if you can remember him, a memoir by Peter Townsend (Time and Chance; gallant pilot makes the mistake of a lifetime at Buckingham Palace)."

JANICE GROSS STEIN

Belzberg Professor of Conflict Management, University of Toronto and director of the University of Toronto's Munk School of Global Affairs

What she recommends:

The Thousand Autumns of Jacob de Zoet by David Mitchell. "This is a singular writer, with an extraordinary sensibility to language, rhythm and pace. He is a joy to read, and this novel is among his finest."

What Science Offers the Humanities: Integrating Body and Culture by Edward Slingerland. "A particular pleasure, Slingerland looks at new research in neuroscience and takes apart the mind-body divide that informs so much of the way we think. The prose is readable and the knowledge is so important."

What she is reading:

Solar by Ian McEwan. "I read McEwan for the chill, the coldness at the core that comes when you least expect it, around a corner that you don't plan to turn..."

Fooled by Randomness: The Hidden Role of Chance in Life and in the Markets by Nassim Nicholas Taleb. "With arrogance and self-assurance, Taleb wanders through history, mathematics and probability. The scope and the breadth are quite wonderful, an antidote to the narrowness of so much of contemporary work."

And, when she's tired:

About Face by Donna Leon. "I join my favourite detective in Venice..."

EUGENIA KUMACHEVA

Professor of chemistry, University of Toronto

An expert in physical and polymer chemistry, Kumacheva won the 2008 L'Oreal-UNESCO For Women in Science prize for developing new materials with myriad applications, including targeted drug delivery.

What she recommends:

Eurekas and Euphorias: The Oxford Book of Scientific Anecdotes by Walter Gratzer. "This is an insightful and entertaining book that describes the episodes of drama and comedy of scientific discoveries. Although entitled 'an Oxford book of scientific anecdotes,' it can be opened at random to meet scientists making discoveries in prison cells or in a madhouse, the physicist dissolving his Nobel Prize medal in acid in order to prevent it from falling into the hands of the Nazis, or the battle of the female scientist with the French Academy."

What she is rereading:

"The novels and short stories by the Russian writer, pilot, explorer and adventurer Alexander Kuprin. He was one of the most popular writers in Russia in the early 20th century. Kuprin drew inspiration from the daily lives of people around him, blending realism with romanticism. My favourite novels are The Garnet Bracelet (the tragedy and beauty of hopeless love) and Yama (The Pit) about the life of prostitutes... Kuprin lived in my hometown, Odessa.

RAY JAYAWARDHANA

Professor of astronomy and astrophysics, University of Toronto

A Canada Research Chair in observational astrophysics, and expert in the formation of stars, planets and brown dwarfs, Jayawardhana won the 2009 Steacie Prize, one of Canada's most prestigious honours for stars in science and engineering. He is also an award-winning science writer.

What he recommends:

The World Is What It Is: The Authorized Biography of V.S. Naipaul by Patrick French. "It is a gripping and somewhat ruthless portrait of the literary giant."

Along with two of his old favourites: Things Fall Apart by Chinua Achebe and The Old Man Who Read Love Stories by Luis Sepulveda. "Both are deceptively simple yet powerful tales that stay with you for a long time."

What he is reading:

There are a few on his shelf:

The Age of Wonder by Richard Holmes (about how scientific discoveries of 18th-century Britain fed the Romantic imagination), The Ascent of George Washington by John Ferling ("because I'm a bit of a political junkie!"), and Wolf Hall by Hilary Mantel ("frankly, I want to know what all the buzz is about.")

MICHAEL POLLANEN

Director of the University of Toronto's Centre for Forensic Science and Medicine and chief of the Ontario Forensic Pathology Service

Pollanen was a member of the Canadian team deployed to help identify victims of the Jan. 12 earthquake in Haiti.

What he is reading and recommends:

Quantum: Einstein, Bohr and the Great Debate about the Nature of Reality by **Manjit Kumar.** "I want to see if the Einstein-Bohr debate sheds any light on the nature of scientific controversy."

What he will reread and recommends: The Story of San Michele by Axel Munthe. "The best historical memoir (published 1929) of a doctor's life that has ever been written. It has hilarious stories about the doctor-patient relationship!"

NATALIE ZEMON DAVIS

Professor of medieval studies, University of Toronto

A renowned historian, Zemon Davis won the 2010 Holberg International Memorial Prize, which is awarded for outstanding scholarly work in the arts and humanities, social sciences, law or theology.

What she recommends:

Out Stealing Horses by Per Petterson. "A gripping novel about relations between fathers and sons and the perplexities of family life in rural Norway after World War II. A splendid translation from the Norwegian."

I Shall Not Hate: A Gaza Doctor's Journey by Dr. Izzeldin Abuelaish. "A moving and ultimately hopeful memoir on the struggle of a Gaza refugee to make his vocation as an obstetrician and fertility specialist and of his collaboration and friendship with some Israeli physicians to create bonds that go beyond Hamas rockets and IDF war planes and Israeli security walls."

What she is reading (or plans to read):

Das Geheimnis des Kalligraphen by Rafik Schami. "I've just started this amazing novel, The Secret of the Calligrapher, by the Syrian-German novelist Schami. It's set in the 1950s in Damascus, and I want to learn more about life in that part of the world.

"I'm interested in letters and the mysteries of writing, which seem to be all tied up with human love. I'm also enjoying the improvement of my reading of literary German."

The Book of Secrets by M.G. Vassanji. "I have loved his other novels, and this one, which has a historical dimension to it, looks intriguing."

Why Translation Matters by Edith Grossman.

"Translation is a major theme in my own historical inquiry and writing of late, and I want to see how this master of literary translation thinks about her practice."

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New Scientist

August 7, 2010

A matter of faith

BYLINE: **Manjit Kumar**

SECTION: OPINION; No. 685

LENGTH: 712 words

HIGHLIGHT: A thought-provoking meditation on how science is inevitably shaped by belief

"While religious beliefs may be left at the laboratory door, philosophical beliefs are not so easy to sideline"

The faith that underpins science

In Why Beliefs Matter: Reflections on the nature of science, E. Brian Davies ponders the impossibility of escaping our philosophical beliefs

Why Beliefs Matter: Reflections on the nature of science by E. Brian Davies, Oxford University Press, £25

Reviewed by **Manjit Kumar**

ALBERT EINSTEIN once asked, does the moon exist when no one is looking at it? Such questions had been the preserve of philosophers, but with the discovery of quantum mechanics in the 1920s they became

legitimate queries for physicists, too.

Niels Bohr, one of the founders of quantum mechanics, did not believe that science grants us access to an objective reality and insisted that the task of physics was not to find out "how nature is" but only "what we can say about nature". Einstein, on the other hand, maintained an unshakeable belief in a reality that exists out there. Otherwise, he said, "I simply cannot see what it is that physics is meant to describe".

Einstein based his view of quantum mechanics on his belief in an independent reality -; the moon does exist when no one is looking at it. In contrast, Bohr used the theory to construct and underpin his belief that the atomic realm has no independent reality. The two agreed on the equations but disagreed on what they meant.

"Scientists, like everyone else, have beliefs," writes distinguished mathematician E. Brian Davies in Why Beliefs Matter. He is not only referring to religious beliefs but to philosophical ones, too. While religious beliefs can be easy to leave at the laboratory door, philosophical beliefs are much harder to sideline.

Some mathematicians, for instance, subscribe to a Platonic view in which theorems are true statements about timeless entities that exist independent of human minds. Others believe that mathematics is a human enterprise invented to describe the regularities seen in nature. The very idea that nature has such regularities which render it comprehensible is itself a belief, as is the idea that the world we perceive is not some sort of delusion or practical joke.

The title of Davies's book, significantly, is a statement, not a question. For him, beliefs do matter. Davies offers a series of snapshots of how various philosophical views inform science, rather than a systematic inquiry into the nature of belief. Along the way he discusses the scientific revolution, the mind-body problem, machine intelligence, string theory and the multiverse. The result is a wide-ranging, thought-provoking meditation rather than a populist read. Beliefs, it seems, are a serious business, and they come in all shapes and sizes.

"At the highest level, beliefs become world views, fundamental beliefs that we use to evaluate other beliefs about the world," says Davies. World views can be evaluated, compared and changed, but you cannot avoid having one. Davies is a self-proclaimed pluralist. That is, he believes that humans have a limited mental capacity and will always need a multiplicity of ways of looking at the world in order to understand it. There may be two or more equally valid and complementary descriptions of the same phenomenon, he says -; not unlike the concept of wave-particle duality in quantum mechanics. That does not mean that all world views are equally good -; some simply don't hold up under the scrutiny of experiment.

The scientific revolution that began in the 16th century was a triumph of rationality and experiment over the superstition and speculation of the Middle Ages. Even so, nearly 40 per cent of Americans believe that God created humans some time within the last 10,000 years.

World views are not founded on logic, so the most that one can demand is that they should be consistent with what science has discovered. Yet, as the writer C. S. Lewis noted, some arguments are impossible to refute. "A belief in invisible cats cannot be logically disproved," he said, although it does "tell us a good deal about those who hold it". n

Manjit Kumar is the author of Quantum: Einstein, Bohr and the great debate about the nature of reality (W. W. Norton, 2010)

Is what we call reality anything more than a construct of the human mind?

LOAD-DATE: January 18, 2011

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Magazine

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The Vancouver Sun (British Columbia)

July 26, 2010 Monday
Final Edition

At 82, Mose goes and goes; Singer-pianist releases first new material in 10 years

BYLINE: Marke Andrews, Vancouver Sun

SECTION: ENTERTAINMENT; Pg. C3

LENGTH: 352 words

My brain is losing power 1,200 neurons every hour My brain.

So sings Mose Allison on My Brain, opening track of his new CD The Way of the World. The song will alarm aging baby boomers everywhere, but if they age like Allison, they won't have much to worry about.

The singer-pianist, 82, still runs or swims every day, still writes songs full of wry humour and still spends almost half his year on the road, playing 100 to 125 concerts annually. The road will lead him to the Vancouver East Cultural Centre tonight, where he'll front a trio, with Vancouver musicians Rene Worst on bass and John Nolan on drums.

In a telephone interview from his home in Eastport, Long Island, Allison maintains the science of My Brain is legitimate.

"That was taken from one of the science books I read," says Allison, adding that the song is basically a reworking of Willie Dixon's My Babe, which, in turn, was a take on the gospel song This Train. "They say that after a certain age, you lose a lot of neurons, and I figured it out and it came to about 1,200 neurons an hour.

"Now they say you can regenerate neurons. Who knows?"

The brain has been, pardon the pun, on Allison's mind lately. Perhaps that can be expected, given Allison's curiosity about the world. This summer, between daily jogs and swims, he finds time to read from **Manjit Kumar's** book Quantum: Einstein, Bohr and the Great Debate about the Nature of Reality.

Not that he's devouring Kumar's prose.

"I don't know how much I'm getting out of it. It's kind of cloudy," he says with a chuckle.

The Way of the World is Allison's first recording of new material in more than a decade.

He had stated he was done making records, but two years ago while in Dusseldorf, Germany, producer Joe Henry convinced him to record with him. Over the years, many big-name artists have recorded Allison's songs, including Allison's friend Van Morrison, who made the tribute CD Tell Me Something.

mandrews@vancouversun.com

- - -

At A Glance

MOSE ALLISON TRIO

When: Tonight, 8 p.m.

Where: Vancouver East Cultural Centre

Tickets: $38 and $35, at the VECC box office, 604-251-1363, or at thecultch. com

LOAD-DATE: July 26, 2010

LANGUAGE: ENGLISH

DOCUMENT-TYPE: News

PUBLICATION-TYPE: Newspaper

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Providence Journal

July 25, 2010 Sunday

Leaping into the history of quantum theory

BYLINE: Sam Coale, Special to the Journal

SECTION: FEATURES; Arts/Travel; Pg. 5

LENGTH: 599 words

Something deeply hidden had to be behind things, Albert Einstein thought as a child, thereby expressing the human need and compulsion to see through, behind and beyond the world that we inhabit in order to discover religious truths, scientific laws or cosmic visions.

In this clearly written and understandable analysis of quantum theory, the major discovery of 20th-century

physics, **Manjit Kumar**, who has degrees in both philosophy and physics and is the author of Science and the Retreat from Reason, tackles an epic task and interweaves his chronological saga with biographies and backgrounds of all the major physicists who were involved from Einstein, the Pope, to Niels Bohr, the Danish King, from Paul Dirac s silences to Wolfgang Pauli s sarcastic asides, from French princes to German professors, laboratories and thought experiments to the quantum leaps of physicists from the major universities and institutes in Munich, Gottingen, Copenhagen and Berlin.

When Max Planck in 1900 discovered the quantum, the indivisible packet of energy, as well as matter, he was unaware that he had destroyed centuries of Newton s mechanical, deterministic and materialistic vision of the cosmos, undermining notions of gravity and clearly defined orbits.

In 1905, Einstein discovered that light was a particle, made up of quanta, and thus upended the century-long belief in light as a wave, though Newton had thought in terms of particles of light as well. Einstein went on to conjure up relativity, in which matter and energy, forever separate before 1905, became interchangeable, limited only, as in all things, by the speed of light.

Kumar makes the fifth Solvay conference in Brussels in October 1927 the centerpiece of this fascinating, intriguing tale of speculations made and shattered, friendships formed and strained, lavish correspondences that exploded and collapsed, and the heady rush to publish papers in leading journals in order to stake out the latest possible theory and reveal yourself on the cutting edge of the new, confounding vision of the subatomic world.

Politics also intervenes, with the Nazis condemning Jewish physics and the flight into exile of many German scientists. At that conference, Einstein and Bohr squared off in terms of what all the quantum mechanics, matrices and wave equations meant, wrestling with one another s theories in terms not of animosity but of camaraderie.

Bohr had decided that everything was both a particle and a wave the central conundrum of quantum theory mutually exclusive but necessary. However, one could measure the radioactive traces of electrons and photons on photographic screens only as particles or waves, never simultaneously. Because he believed that the act of measurement always interferes with and disturbs what we are seeing, we can only see snapshots of the quantum realm. An unobserved electron does not exist, he declared. Uncertainty, discontinuity, chance and accident govern all things. Only statistical probabilities worked.

Einstein, on the other hand, believed that the subatomic realm exists independent of human observation. Quantum theory had proved itself, but it was incomplete, and that possibility of incompleteness has dominated the study of physics ever since. How does measurement interfere? Is there a border between the quantum realm and our own?

Kumar has done a splendid job of explaining complex theories and describing the people involved with discovering them, mired in cultural and historical upheavals that haunted all of them. This is a necessary, mesmerizing and meticulous volume.

LOAD-DATE: July 25, 2010

LANGUAGE: ENGLISH

NOTES: Sam Coale (samcoale@cox.net), chairman of Wheaton s English department, is working on a book called Quirks of the Quantum: Postmodernism in Contemporary American Fiction. Sam Coale (samcoale@cox.net), chairman of Wheaton s English department, is working on a book called Quirks of the Quantum: Postmodernism in Contemporary American Fiction.

PUBLICATION-TYPE: Newspaper

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Canwest News Service

July 21, 2010 Wednesday 07:01 PM EST

At 82, jazz great Mose Allison goes and goes

BYLINE: MARKE ANDREWS, Vancouver Sun

LENGTH: 593 words

Mose Allison Trio

Monday, 8 p.m.

Vancouver East Cultural Centre

Tickets: $38 and $35, at the VECC box office, 604 251-1363, or at thecultch.com

My brain is losing power

1.200 neurons every hour

My brain.

So sings Mose Allison on My Brain, opening track of his new CD The Way of the World. The song will alarm aging baby boomers everywhere, but if they age like Allison, they won't have much to worry about.

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He had stated he was done making records, but two years ago while in Dusseldorf, Germany, producer Joe Henry convinced him to record with him. Allison didn't dwell on the idea, but Henry did, sending a series of e-mails to Allison's wife, Audre.

The CD, recorded last July, came out in March.

Over the years, many big-name artists have recorded Allison's songs, including Allison's friend Van Morrison, who made the tribute CD Tell Me Something. So are the royalties rolling in to Eastport, Mose?

"They vary," he answers, saying his best royalties have come from The Who's 1970 album Live at Leeds, on which the rock group performed Young Man Blues, and from B.C. native Diana Krall's version of Stop This World, on her CD The Girl in the Other Room.

"I didn't know she sold that many records," Allison says. "She sells a lot."

Whenever he travels, Allison likes to hire local musicians for his rhythm section, partly for economics, and partly for the chance to play with different people.

"I found if you take musicians [with you] and you pay airfares and hotel rooms and the whole number, you don't come out of it with any money.

"Now, there's good players everywhere. Fifty years ago, all the good players were in New York or Los Angeles or someplace else, but now you can get good players anywhere."

Allison still makes the bulk of his living from performing. He says he still gets a lot out of playing live, provided the musicians and the conditions are good. Otherwise, he says, "It's work."

The road always has its surprises. A Mississippi native, Allison recently did a concert at the birthplace of the blues, Clarksdale, Miss. But when he showed up for the concert, there was no piano.

"I gave them an hour to get a keyboard, and they did," he said. "It was a pretty good piano."

mandrews@vancouversun.com

LOAD-DATE: July 22, 2010

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newswire

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New Scientist

July 17, 2010

Elusive stuff

BYLINE: **Manjit Kumar**

SECTION: OPINION; No. 682

LENGTH: 490 words

HIGHLIGHT: The concept of energy is explained through this intriguing history of its discovery

The discovery of energy

Jennifer Coopersmith explains the concept of energy through the history of its discovery in Energy, the Subtle Concept

Energy, the Subtle Concept: The discovery of Feynman's blocks from Leibniz to Einstein by Jennifer Coopersmith, Oxford University Press, £29.95

Reviewed by **Manjit Kumar**

MOST of us have a vague idea of what energy is, if only because we have to pay for it. We know that it is the E in Einstein's famous equation, E=mc2, and all of us have an opinion about the pros and cons of nuclear energy. For William Blake's devil in The Marriage of Heaven and Hell, energy was "eternal delight", yet Newton never fully appreciated the importance of a concept that was rarely used until the 19th century.

So, what is energy? Easy to ask the question but, as Jennifer Coopersmith shows in Energy, the Subtle Concept, finding the answer was a messy and tangled affair, involving plenty of argument and controversy. It's a tale of persecuted genius, of royal patronage, of social climbers and dreamers, of rich men and poor men, a foundling, entrepreneurs and industrialists, lawyers, engineers, a taxman, a spy and a brewer. Some were showered with honours, others neglected until long after death.

The concept of energy is hard to grasp because it is something that cannot be directly observed. It was only in the early 19th century that it was even recognised as a distinct physical quantity. Since then it has played a vital role in the development of science and technology. Its importance lies in the fact that it possesses the very rare property of being preserved. Energy cannot be created or destroyed; it can only be converted from one form to another. So fundamental is this property to nature that it is enshrined, in more sober scientific terms, as the first law of thermodynamics.

The first step on the long road to understanding the true nature of this relationship had been taken in the 1800s by Benjamin Thompson, an Anglo-American physicist, inventor and soldier of fortune. While supervising the boring of new cannons Thompson realised that heat might be a form of motion rather than a special weightless substance called "caloric". Most remained unconvinced, largely because Thompson was a notorious opportunist and spy. The turning point came in the form of experiments performed, in the 1840s, by English brewer and amateur scientist James Prescott Joule, who introduced the term thermodynamics.

The conservation of energy is arguably the most important law in physics. But what exactly is being

conserved? Are some forms of energy more fundamental than others? You will have to read the book to find out. Coopersmith sets out to answer such questions and to explain the concept of energy through the history of its discovery. This is neither a straightforward narrative nor one for the faint-hearted. Those not put off by the odd bit of mathematics, will be well-rewarded by dipping into this book.

LOAD-DATE: January 18, 2011

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Magazine

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62 of 108 DOCUMENTS

Birmingham Evening Mail

July 13, 2010 Tuesday
First Edition

DEBATE CANCELLED

SECTION: NEWS; Pg. 11

LENGTH: 17 words

THE Birmingham Salon's debate tonight on Quantum Theory has been cancelled. Speaker **Manjit Kumar** is ill.

LOAD-DATE: July 13, 2010

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newspaper

JOURNAL-CODE: em

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63 of 108 DOCUMENTS

Birmingham Evening Mail

June 24, 2010 Thursday
First Edition

Salon set for theory debate

SECTION: NEWS; Pg. 16

LENGTH: 49 words

QUANTUM theory is the subject of the next debate at the Birmingham Salon, which takes place on Tuesday, July 13, from 7pm at The Studio on Cannon Street.

The debate will be led by **Manjit Kumar,** and atendees in full time employment will be asked to donate pounds 5. Visit www.birminghamsalon.org.

LOAD-DATE: June 24, 2010

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newspaper

JOURNAL-CODE: em

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The New York Times

June 20, 2010 Sunday
Late Edition - Final

Editors' Choice: Recent books of particular interest

SECTION: Section BR; Column 0; Book Review Desk; Pg. 18

LENGTH: 301 words

THE LAST STAND: Custer, Sitting Bull, and the Battle of the Little Bighorn, by Nathaniel Philbrick (Viking,

$30.) The author of "Mayflower" gives appropriate space to Sitting Bull, Crazy Horse and others who fought that day, but Custer steals the show.

IN THE PLACE OF JUSTICE: A Story of Punishment and Deliverance, by Wilbert Rideau (Knopf, $26.95.) Rideau's painfully candid memoir describes his decades in Louisiana's notorious Angola prison.

QUANTUM: Einstein, Bohr, and the Great Debate About the Nature of Reality, by **Manjit Kumar** (Norton, $27.95.) Quantum mechanics made fascinating for readers who'd rather skip the mathematical complexities.

EMPIRE OF THE SUMMER MOON: Quanah Parker and the Rise and Fall of the Comanches, the Most Powerful Indian Tribe in American History, by S. C. Gwynne (Scribner, $27.50.) The story of the last and greatest chief of the rulers of the Great Plains.

ROLE MODELS, by John Waters (Farrar, Straus & Giroux, $25.) Waters's latest exercise in autobiography at one remove proves he hasn't been undone by the realization that he's not outrageous anymore.

ONE MORE THEORY ABOUT HAPPINESS: A Memoir, by Paul Guest (Ecco/HarperCollins, $21.99.) The poet writes more directly than ever before about his paralysis, the result of a childhood accident.

BURMESE LESSONS: A True Love Story, by Karen Connelly (Nan A. Talese/Doubleday, $27.95.) This passionate, poetic memoir is an intimate account of a country, a relationship and a man, all of them elusive.

THE SPOT: Stories, by David Means (Faber & Faber, $23.) Like Beckett, Means reveals a God-like inclination to see his characters as forsaken case studies.

THE REHEARSAL, by Eleanor Catton (Reagan Arthur/Little, Brown, $23.99.) A girls' school is rocked by a teacher-student affair in this intricate first novel.

URL: http://www.nytimes.com

LOAD-DATE: June 20, 2010

LANGUAGE: ENGLISH

DOCUMENT-TYPE: List

PUBLICATION-TYPE: Newspaper

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65 of 108 DOCUMENTS

The New York Times

June 13, 2010 Sunday
Late Edition - Final

Random Acts of Science

BYLINE: By GRAHAM FARMELO.

Graham Farmelo is the author of ''The Strangest Man,'' a biography of Paul Dirac.

SECTION: Section BR; Column 0; Book Review Desk; Pg. 25

LENGTH: 1264 words

QUANTUM

Einstein, Bohr, and the Great Debate About the Nature of Reality

By **Manjit Kumar**

448 pp. W. W. Norton & Company. $27.95

Quantum mechanics is the most revolutionary scientific theory to appear in the past 150 years. In the atomic domain, it superseded laws first set out by Isaac Newton a quarter of a millennium earlier and has since had an unbroken string of successes. Today, it continues to give an utterly reliable account of the behavior of the subatomic world, yet there are nagging doubts that there is something rotten at its core.

In his lively new book, ''Quantum,'' the science writer **Manjit Kumar** cites a poll about the interpretation of quantum mechanics, taken among physicists at a conference in 1999. Of the 90 respondents, only four said they accepted the standard interpretation taught in every undergraduate physics course in the world. Thirty favored a modern interpretation, laid out in 1957 by the Princeton theoretician Hugh Everett III, while 50 ticked the box labeled ''none of the above or undecided.'' Almost a century after a few physicists first set out the basic theory, quantum mechanics is still a work in progress.

It was the German theoretician Max Planck who first presented the idea that energy is fundamentally granular. In a lecture given in the closing weeks of 1900, he described his bizarre proto-theory that when light and matter interact, energy cannot be transferred in arbitrary amounts, as would be expected on the basis of Newton's account. Rather, Planck suggested, energy transfers take place only in discrete chunks, which he called ''quanta.'' A deeply conservative thinker, he was never comfortable with this notion, which he saw as a ''purely formal assumption,'' and was unconvinced when the young Albert Einstein suggested -- in what he considered to be his only revolutionary contribution to science -- that it was possible to think of light in terms of particles, later called photons. Planck died, almost 50 years later, unwilling to believe the picture of light that he himself had introduced. This is a classic example of the adage that physics progresses through a succession of funerals -- of the pioneers who could not live with the consequences of their most radical work.

In resisting the photon concept, Planck was in good company. Another influential skeptic was the Danish physicist Niels Bohr, a remarkably profound thinker and inveterate mumbler who continually struggled to find coherent expressions of his ideas. (''You should never express more clearly than you can think,'' he would whisper to often-baffled colleagues.) Bohr at first refused to believe in the reality of photons, even after the American experimenter Arthur Compton first found compelling evidence for them in 1922. For a short time, Einstein was in the vanguard of quantum theory, while Bohr lagged behind.

For many of the physicists who forged the first comprehensive quantum theory in the second half of the 1920s, Bohr was a kind of intellectual godfather. Through cajoling and persistent tactful criticism, he helped them to do their best work and produce the components of the theory, whose coherence and unity emerged only gradually. One of its creators, the taciturn English physicist Paul Dirac, liked to point out that quantum mechanics was the first mathematical theory in science in which the discoverers did not fully understand the meaning of the terms in their own equations.

''Quantum'' is a wide-ranging account, written for readers who are curious about the theory but want to

sidestep its mathematical complexities. It's full of a surprising amount of detail, perhaps rather more than most readers will want. The story is chock-full of colorful characters, including the two physicists who independently set out the first two versions of the theory, which initially appeared to be quite different. The first was the young Werner Heisenberg, not two years past his doctorate, fun-seeking and intensely competitive, not least at the Ping-Pong table. The other was the older Erwin Schrodinger, an Austrian polymath who scandalized his conservative colleagues by showing up at conferences in his climbing gear, sometimes accompanied by an adolescent lover.

Kumar will not win prizes for historical originality. This is an unapologetically orthodox account, largely derived from the standard sources and without the benefit of some of the latest scholarship. Occasionally, the narrative appears to be driven by a wish to thread together every amusing story, anecdote and famous quotation. There is, however, no doubt about the author's skill in making accessible the philosophical controversies in his story, especially the debates between Bohr and Einstein. For Bohr, physics was not about finding out what nature is, but about what can be said about it. Quantum mechanics was a complete theory of the behavior of matter and light, and we just have to come to terms with the limitations it places on what can be known, for example as illustrated by the Heisenberg uncertainty principle. Einstein was having none of it. He believed that there is an objective world out there and that it is the job of scientists to describe it. The appearance of probabilities in the theory was, for him, evidence of its incompleteness.

In 1964, after both Einstein and Bohr had died, the Irish physicist John Bell did something they had failed to do; he found a way of testing experimentally which of their opposing viewpoints most accurately described nature, by laying out a mathematical theorem. In the denouement of ''Quantum,'' Kumar describes the result of the experiment, which I shall not reveal, though I think it fair to say it leaves us feeling that the story of quantum mechanics is not yet over.

In the late 1970s, I had the pleasure of talking with John Bell about the Bohr-Einstein debates during a train journey from Oxford to London. Every seat was taken, so we had to stand. Pressed against me by sullen commuters, Bell summarized his apparently reluctant conclusion as we pulled into Paddington station: ''Bohr was inconsistent, unclear, willfully obscure and right. Einstein was consistent, clear, down-to-earth and wrong.''

Einstein, always his own man, never cared whether his colleagues regarded him as wrongheaded. While the public all over the world regarded him as a kind of sage, he knew that his fellow physicists -- especially younger ones -- saw him as eccentric or even senile. In the early 1940s, the theorist John Wheeler visited him at his home in Princeton to brief him on a new development in quantum theory and to ask if he would now accept it. ''I still can't believe that the good Lord plays dice,'' Einstein replied. After a pause, he added, ''Maybe I have earned the right to make my mistakes.'' Yet Einstein never publicly accepted that he was mistaken; nothing was going to persuade him to change his way of looking at the world. A few years later, he told a friend that he believed ''in a world that objectively exists, and which I, in a wildly speculative way, am trying to capture.'' It seemed he could not live with the consequences of his most revolutionary idea.

Kumar ends his fascinating book with the verdicts of some of today's leading physicists on Bohr's and Einstein's contrasting views on quantum mechanics. It is clear from this that quite a few of Einstein's most distinguished successors believe he was right to say that the theory is fundamentally unsatisfactory and that we need a deeper account of reality. The sage of Princeton may yet have the last chuckle.

URL: http://www.nytimes.com

LOAD-DATE: June 13, 2010

LANGUAGE: ENGLISH

GRAPHIC: PHOTO: Niels Bohr in 1957.

DOCUMENT-TYPE: Review

PUBLICATION-TYPE: Newspaper

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THE TIMES
The Times (London)

June 5, 2010 Saturday
Edition 1;
National Edition

A new golden age of science writing; Bestsellers are making us experts in everything from cosmology to clocks, says Graham Farmelo

BYLINE: Graham Farmelo

SECTION: SATURDAY REVIEW;FEATURES; Pg. 8

LENGTH: 2303 words

Stephen Hawking was the first holder of the University of Cambridge's prestigious Lucasian Chair in its 324-year history to write a bestseller. Published in 1988, A Brief History of Time sold tens of millions of copies and reminded the books industry of the vast popular appetite for the big ideas of science. Hawking reserved his best line until the very end - if scientists could find a mathematical theory for the fundamental workings of nature, he wrote, "then we would know the mind of God". He almost cut the line in proof.

A Brief History of Time was by no means the first inf luential popular science book of the modern era. Its publication followed Richard Dawkins's lucid The Selfish Gene and the even silkier The Blind Watchmaker, which introduced new thinking about biology to a wide public and to quite a few scientists (me included). But it was Hawking who did most to make science writing a legitimate activity for serious researchers and to immunise them from the sting of the familiar "peer sneer". His success also persuaded publishers that science, especially cosmology, was sexy and that there was an untapped reservoir of literary talent among top-flight scientists.

As a result, the Nineties produced a boom in popular science writing. Book stores gave shelf space to thousands of science books, covering everything from algorithms to zebra fish. This was the first time since the second half of the 19th century, when popular science books first appeared, that lay readers could read in depth about almost every branch of modern science and even mathematics. It is now possible for readers of popular science books to have a broader knowledge of modern science than specialists focused solely on a single subject.

One of the benefits of this burgeoning of popular science has been that the public has a ringside seat in another simultaneous golden age, in cosmology. Many of the expensively commissioned books on the subject failed to make the grade, after publishers apparently neglected to check that their prospective authors could write. But we have been kept consistently informed about the latest thinking about the Universe, notably in several fine books by the Astronomer Royal, Martin Rees.

Evolution and genetics did most to fuel the boom and a handful of scientists have become our favourite biology teachers, including the witty Steve Jones, the forthright Matt Ridley and the late essayist Stephen Jay Gould. Most impressive of all of them, perhaps, is Jared Diamond, whose Guns, Germs and Steel illuminates the factors that make certain societies apparently much more successful than others. Some of the biggest successes in science publishing have come from left field. No one could have expected a hit book from an account of how a shy mathematician solved a deceptively simple-looking mathematical puzzle, yet that is what Simon Singh achieved in Fermat's Last Theorem. Likewise, Dava Sobel achieved sales that publishers normally only dream about with Longitude, about as unlikely a subject for a popular tale as you could imagine - precision clock-making in the 18th century. Publishers spent a decade seeking to replicate its success, but in vain. Still more impressive among the mega-sellers was A Short History of Nearly Everything, in which Bill Bryson brought his charm to a Cook's tour of science. I doubt whether any science specialist has yet engaged a mass audience so effectively.

In the year Hawking published A Brief History of Time, the Science Book Prize began. Organised by the Royal Society, the prize does much to publicise the best science books. The winner last year, Richard Holmes's The Age of Wonder - a rich account of how the romantic poets worked alongside several leading scientists at the time - is the first work on the history of science, and the first to illuminate connections between the sciences and the arts, to take the prize. The Wellcome Trust recently set up another science prize, with a £20,000 bounty, to celebrate medicine in either fiction or nonfiction. Its most recent winner, Andrea Gillies' account of her mother-in-law's Alzheimer's, Keeper, had not been reviewed in a single newspaper.

We are living in golden age of science writing, but should not forget that there have been others. In the late Twenties and early Thirties, the mathematical physicists Arthur Eddington and James Jeans, and the biologist J. B. S. Haldane commanded a huge popular audience. They took a lot of flak for venturing into the public domain, especially from the great panjandrum C. P. Snow, who, in 1931, denounced the "great evil" perpetrated by popular science writers, before becoming one himself.

In The Mysterious Universe, published in 1930, Jeans wrote that the "Great Architect of the Universe now begins to appear as a pure mathematician" and that the Universe itself was beginning to look less like a machine and "more like a great thought". Jean's poetic vision has endured.

Graham Farmelo's The Strangest Man won the 2009 Costa Prize for Biography and the 2010 Los Angeles Times Science Book Prize

My favourite science book

Richard Holmes

What strikes me most is the transformation in science biography, where intrinsically obscure subjects such as quantum physics or X-ray crystallography are brilliantly explained in terms of individual life stories, pure adventures of the human spirit, producing spellbinding books such as Graham Farmelo's The Strangest Man (Faber and Faber) or Georgina Ferry's Dorothy Hodgkin (Granta). Moreover a new genre has arisen, the group or generation biography, where the added dimensions of teamwork, competition, and personal rivalry turn science into an enthralling kind of social history, as in Lisa Jardine's Ingenious Pursuits (Abacus), Jenny Uglow's The Lunar Men (Faber and Faber) or **Manjit Kumar's** Quantum (Icon). Mathematics would seem the hardest nut to crack biographically, yet this is exactly what Simon Singh achieves in Fermat's Last Theorem (HarperPerennial). These would be my representatives of the new Golden Age.

Richard Holmes's The Age of Wonder is published by HarperPress

Malcolm Gladwell

Of the many science books that have influenced me, I would pick The Person and the Situation (McGraw Hill) by Lee Ross and Richard Nisbett as probably the most important. Nisbett is my intellectual hero: his work has been a central influence on all of my books. And it was The Person and the Situation that got me started. It is a devastating, experimentally proved critique of the notion of individual autonomy. Our behaviour is not constructed from the inside out, Ross and Nisbett argue; it is constructed from the outside in.

Context powers personality. It's safe to say that I have been exploring the implications of that insight ever since. For some inexplicable reason, the book is now out of print - which is a shame because it strikes me that as a society we have never been in more need of its insight.

Malcolm Gladwell's What the Dog Saw is published by Penguin

Rebecca Skloot

Storytelling is important and underused in science writing. People want to understand science, but they need stories to show them why they should care. Randy Shilts was a master storyteller and reporter. He became an investigative science writer by circumstance: it was the Eighties in San Francisco, he was gay, his friends and neighbours were dying of Aids, and the Government seemed to be ignoring the growing epidemic. So Shilts, a San Francisco Chronicle reporter, ended up writing one of the most important science books ever: And the Band Played On: Politics, People, and the Aids Epidemic (Penguin). Through storytelling mixed with scientific facts, he made the world care deeply about what could have been a dry story.

The first piece I read by Shilts was an essay called "Talking Aids to Death". I finished it and said to myself, I want to write like that guy.

Rebecca Skloot's The Immortal Life of Henrietta Lacks is reviewed by Mark Henderson on page 10

Margaret Atwood

Stephen Jay Gould. Sigh. Dead now, alas, but what a blazing light he was, translating the findings of science for over 30 years into easily understood essays for the likes of me. Walt Disney fans may remember his piece on "The Neotony of Mickey Mouse", in which he traced the progressively juvenile evolution of rat-like Steamboat Willie into baby-faced Mickey ... Wonderful Life (Vintage), based on the freaky fossils of the Burgess Shale in British Columbia, is Gould's entertaining thesis about the role of chance in evolution. We're finely adapted to our present conditions, but a sudden change may mean that some other life form (slugs? slime mould?) may survive us and become "intelligent". Only happenstance, says Gould, that we don't have five eyes. Pity.

Margaret Atwood's latest novel, The Year of the Flood, is published by Bloomsbury

Ben Miller

It irks me to distraction the way that "best of" lists inevitably pick not the best of any given crop but the most recent. Nevertheless, I am going to boldly nominate the insuperable Bad Science (HarperPerennial) by Ben Goldacre, and not, really not, because it's one of the most recent popular science books I happen to have read. I want to nominate it because it empowered and remade my understanding of medicine, swept away a lot of occult muddiness in my thinking, and also inspired me to write about science myself. For those lucky enough to have it lying seductively in wait, I envy you.

What you have in store is a passionate, articulate, painstaking investigative journalism that wholeheartedly joins the fray against nutritionists, quacks and pseudoscientists the world over. And not only that, he has a fantastic recipe for making your own moisturiser.

Comedian Ben Miller writes a column for Eureka, The Times' monthly science supplement

A. S. Byatt

A book that has recently fascinated me, as a reader, as a writer and as a human being, is Ian Hacking's study of the new forms of determinism introduced into human thought by the study of chance, of statistical probability, of the idea of the "normal", the average, the probable human being. The Taming of Chance (Cambridge University Press) begins: "The most decisive conceptual event of 20th-century physics has been the discovery that the world is not deterministic ... A space was cleared for chance." Hacking's book suddenly made it clear to me what was going on in Penelope Fitzgerald's The Gate of Angels, a delightful comedy that tugs at her readers with the sense that there is more significance here than the sheer pleasure of the elegant prose and the satisfactory storytelling.

A. S. Byatt's latest novel, The Children's Book, is published by Vintage

Sir Martin Rees

Scientists' autobiographies tend to be dutiful and worthy. There are, of course, exceptions. An excellent read is The Common Thread (Transworld), by the Cambridge geneticist John Sulston, whose career straddled the transition from the "small" science of the Sixties to the quasi-industrial scale genetics of the Nineties. His greatest achievement, for which he and his mentor, Sydney Brenner, shared a Nobel prize, was to unravel the genetics of the nematode worm. But in the Nineties he moved into big science and oversaw the British segment of the human genome project. Sulston chose to work with a professional writer, Georgina Ferry, who is steeped in Biology's history.

Common Thread is recommended reading for any scientist who wonders whether the idealistic values of science can survive in our more complex world.

Sir Martin Rees is Professor of Cosmology and Astrophysics at the University of Cambridge

David Lodge

There have been many excellent books by scientists on the problem of consciousness, but my favourite is Antonio Damasio's The Feeling of What Happens: Body, Emotion and the Making of Consciousness (Vintage). A neurologist, Damasio has empirical knowledge and clinical experience to draw on, but he avoids the reductionism of materialist approaches to consciousness by emphasising its narrative character. Human consciousness is self-consciousness. We not only have experiences, but are aware of having them, and the construction of the self is analogous to storytelling. "I believe the brain's pervasive 'aboutness' is rooted in the brain's storytelling attitude," he says. This lucid, eloquent book triumphantly bridges the gap between the "two cultures".

David Lodge's latest novel, Deaf Sentence, is published by Penguin

Richard Dawkins

Carl Sagan's The Demon-Haunted World: Science as a Candle in the Dark (Ballantine) is not only a debunking book - though it brilliantly sees off superstition and irrationality of all kinds, from faith-healing and alien abduction to demons and witchcraft, astrology and crop-circles, religion and life after death. What distinguishes this book from mere debunking is Sagan's lyrical evocation of the alternative: science and the scientific world view. There is nothing mundane or prosaic about science. Science is the clear-eyed study of the real world, and in Sagan's hands it rises to poetic heights. Science is the poetry of reality.

Richard Dawkins's The Greatest Show on Earth: The Evidence for Evolution is published by Bantam

China Miéville, Philip Hoare, Alex Bellos, Raymond Tallis and Allegra Goodman pick their favourite science books at thetimes.co.uk/science

*Where you see this symbol, order books at discounted prices, with free p&p, from The Times Bookshop Call 0845 2712134 or visit thetimes.co.uk/ bookshop

The Times Debate

Is this the golden age of science writing? takes place at 4pm on Saturday, June 12, as part of TheTimes Cheltenham Science Festival (June 9-13).

Graham Farmelo, Rebecca Skloot and Ben Miller will take part in a discussion chaired by Erica Wagner. Box office: 0844 5767979 cheltenham festivals.com

LOAD-DATE: June 5, 2010

LANGUAGE: ENGLISH

GRAPHIC: TAKE A BOW Jared Diamond, photographed here with a Papua New Guinea tribesman, is one of a string of scientists whose bold theories have fuelled a renewed interest in science writing
RONALD GRANT ARCHIVE / WALT DISNEY

PUBLICATION-TYPE: Newspaper

JOURNAL-CODE: TIM

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67 of 108 DOCUMENTS

The Calgary Herald (Alberta)

May 23, 2010 Sunday
Final Edition

Calgary Bestsellers

BYLINE: Calgary Herald

SECTION: CONTEXT; Pg. B5

LENGTH: 267 words

THIS WEEK

1 TELL ALL - Chuck Palahnuik. A dark look at being a celebrity.

2 BEATRICE AND VIRGIL - Yann Martel. An author tries to publish his book.

3 STANDOFF TERRAIN

- Jocko Benoit. A collection of poetry.

4 MISTRESS OF NOTHING - Kate Pullinger. A Victorian lady tries to show her maid luxury.

5 THIS BODY OF DEATH - Elizabeth George. An Inspector Lynley novel.

6 THE PREGNANT WIDOW - Martin Amis. A haunting and comedic novel.

7 MURDER ON THE BOW - John Ballem. A murder mystery set in Calgary.

8 SMOKED - Garry Ryan. The fourth mystery with Detective Lane.

9 GIRL WHO KICKED THE HORNET'S NEST

- Stieg Larsson. A woman tries to prove her innocence in a murder.

10 QUESTION OF BELIEF - Donna Leon. A Guido Brunetti mystery.

THIS WEEK

1 GUARDIANS OF THE LAMP - Eleanor King Byers. The Calgary General Hospital and its nursing school remembered.

2 WOMEN FOOD AND GOD - Geneen Roth.

How you eat tells all.

3 CIGAR BOX BANJO - Paul Quarrington. A look at his life lived in music and words.

4 I SHALL NOT HATE

- Izzeldin Abuelaish. The journey of a doctor in the Gaza Strip.

5 ARMAGEDDON FACTOR - Marci McDonald. A look at the rise of Christian nationalism in Canada.

6 EAARTH - Bill Mckibben. A manifesto for life in a tough new planet.

7 DAY TRIPS FROM CALGARY - Bill Corbett. Each trip describes what can be seen and done along the way.

8 TALKING ABOUT DETECTIVE FICTION

- P.D. James. A look at detective fiction from top to bottom.

9 QUANTUM - **Manjit Kumar.** A guide to the conundrums of modern physics.

10 GAME CHANGE - John Heilemann. A look at American politics.

INFORMATION PROVIDED BY OWL'S NEST BOOKS AND PAGES ON KENSINGTON

LOAD-DATE: May 23, 2010

LANGUAGE: ENGLISH

GRAPHIC:
Photo: Chuck Palahnuik, author of such fictional classics as Fight Club, Snuff and Survivor, offers another chaotic tale in Tell All. Funny and dark, the book suggests that Hollywood in the golden days was just as shallow and self-obsessed as it is today.

Photo: Geneen Roth can be considered somewhat of an expert on the difficulties of weight loss. Throughout her life she has gained and lost more than 1,000 pounds. Her struggle led her to question her beliefs and eventually led her to a healthy body and spiritual life. In her latest book, she shares her insight with experience and humour.
Photo: There has been a lot of discussion recently over Marci McDonald's book about the influence of Christianity in the Harper government. While there's little evidence to support many of her arguments, she no doubt knows that sensational headlines make for sensational book sales.

DOCUMENT-TYPE: News

PUBLICATION-TYPE: Newspaper

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Salon.com

May 23, 2010 Sunday

"Quantum": When physics got spooky

BYLINE: Laura Miller

SECTION: LAURA MILLER

LENGTH: 1004 words

HIGHLIGHT: A new history of the birth of quantum physics brings the weird, protean, paradoxical subatomic world to life

"I think I can safely say that nobody understands quantum mechanics," wrote Richard Feynman, and given that he won a Nobel Prize in physics, why should you or I want to take a shot at it? Not that you or I could plausibly claim to understand the weird, protean, paradoxical subatomic world that quantum science describes, but anyone reading **Manjit Kumar's** "Quantum: Einstein, Bohr and the Great Debate About the Nature of Reality" will surely feel they've gotten a bit closer. It's an exhilarating, if also disorienting, sensation.

"Quantum" orbits around the celebrated fifth Solvay conference, held in Brussels in 1927, a gathering of the greatest minds in 20th-century physics. It was at Solvay that Werner Heisenberg and Max Born presented the theory of quantum mechanics they had been working on for several years under the informal leadership of Niels Bohr. Their understanding of subatomic reality came to be called "the Copenhagen interpretation" (after the location of the Institute of Theoretical Physics, which Bohr ran), and its champions proclaimed it a "closed theory, whose fundamental physical and mathematical assumptions are no longer susceptible of any modification."

Albert Einstein, also present, disagreed, and the following decades saw a series of intense, if friendly, arguments between Einstein and Bohr -- who, as Kumar notes, had a diagram of one of Einstein's most famous thought experiments up on his office chalkboard on the day he died in 1962. That experiment, which involved the imaginary weighing of a "box filled with light" before and after a single photon is allowed to escape, is an example of the surreal mental territory that "Quantum" explores. Reading it is a bit like lifting the hood of your mind and moving the working parts around; it's challenging and trippy -- as only the Dr. Seuss realm of the quantum can be.

Kumar, a science writer in Britain (where this book was first published, two years ago), makes a point of playing up the collaborative aspects of the evolution of quantum theory, as well as the conflicts; the two can't really be separated. He begins with Max Planck's reluctant invention of the "quanta" -- an indivisible unit of energy -- in 1900. He insisted it was a mere theoretical, most likely temporary "trick," designed to get certain formulas to work properly. When, five years later, Einstein, during a period of astounding scientific creativity that included his famous paper on special relativity, suggested that light might be made up of "particle-like quanta" (later called photons), he thought of it as his most daring break with the classical physics of Newton. Light, like other forms of energy, had long been believed to flow in continuous waves, not in tiny chunks.

It was in the 1920s that quantum mechanics as we know it was born, with physicists like Heisenberg, Wolfgang Pauli, Erwin Schrödinger and Paul Dirac scrutinizing each other's proposals, seizing upon weak spots to investigate, discovering little-known laboratory data or mathematical methods that might provide a solution and writing important papers only to find that some theoretician in the hinterlands had gotten there first. It was, as Kumar puts it, "a golden age ... unparalleled since the scientific revolution in the 17th century led by Galileo and Newton." The dollops he offers of these scientists' personal lives and youths emphasize the importance of teachers, mentors and patrons, as well as those rare individuals, like Bohr, whose tact and generosity aided in keeping things collegial. (By contrast, 17th century science was impeded by the paranoia and secrecy of Newton.)

That it can be hard to wrap your brain around the principles of the subatomic world is a given. It's a strange kingdom, full of things that don't exist or exist in two opposite conditions at once until somebody looks at them, particles that influence each other instantaneously despite being separated by lightyears and electrons that move from one place to another without traveling through the space in between. Books on the subject rely on good metaphors, clearly explained, and Kumar delivers them, but "Quantum" is not for the complete novice or those timid souls who quail at the sight of an equation. (I can't claim to understand the few equations Kumar includes myself, but they don't scare me away, and I found this book is perfectly intelligible even though I can't do the math.)

Much of the debate between Einstein and Bohr revolved around Einstein's intuitive rejection of the implication of the Copenhagen interpretation -- which is that objective reality, independent of any observer, doesn't really exist. Bohr, by contrast (and sounding a lot like Wittgenstein), insisted that physics isn't concerned with what is but solely with what we can say about it. Not only were these two geniuses battling over where to draw the line between the familiar, cause-and-effect world of classical Newtonian physics and the quantum Wonderland, they were sketching, erasing and resketching the boundary between science and philosophy, debating the nature of reality itself.

Einstein was for many years regarded as a stubborn, even senile holdout against the quantum gospel, but Kumar finds that view simplistic. "Quantum" concludes by surveying developments since the deaths of Bohr and Einstein, such as Bell's Theorem and the many worlds interpretation, some of which point to critical problems that the Copenhagen interpretation left unresolved. (One is how the phenomenon of the universe came to be in the first place if there was no one to observe the Big Bang.) All of this, the author maintains, has led to "a reconsideration of the long-standing verdict against Einstein in his long-running debate with Bohr." Instead, he paints Einstein as a partisan of that most precious of scientific tools: the question. That's why he ends with one of the physicist's favorite quotations, from the German philosopher Gotthold Lessing: "The aspiration to truth is more precious than its assured possession."

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Publishers Weekly Reviews

March 1, 2010

Quantum: Einstein, Bohr, and the Great Debate about the Nature of Reality

BYLINE: Staff

SECTION: REVIEWS; Nonfiction; Pg. 44

LENGTH: 221 words

Quantum: Einstein, Bohr, and the Great Debate about the Nature of Reality **Manjit Kumar**. Norton, $27.95 (464p) ISBN 978-0-393-07829-9

With vigor and elegance, Kumar describes the "clash of titans" that took place in the world of physics in the early 20th century, between physicists who did and those who did not believe in the quantum-the strange concept that we now know to be the underpinning of reality. The titans in Kumar's account of the conflict are Albert Einstein and Niels Bohr. In 1900, Max Planck discovered that electromagnetic radiation and the energy of light are transmitted not in a continuous flow but in small packets called "quanta" (singular, quantum). Bohr applied the idea of quantum to electrons, leading to the development of quantum mechanics. Bohr's theory explained experimental results that were inexplicable in classical theory. Einstein rejected Bohr's theory overturning reality in dangerous but also thrilling ways. The clash culminated at the 1927 Solway conference. Kumar, founding editor of *Prometheus* and a consulting science editor for *Wired UK* , recounts this meaty, dense, exciting story, filled with vivid characters and sharp insights. With physics undergoing another revolution today, Kumar reminds us of a time when science turned the universe upside down. 16 pages of photos. *(May)*

LOAD-DATE: March 4, 2010

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PUBLICATION-TYPE: Magazine

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THE SUNDAY TIMES
The Sunday Times (London)

July 5, 2009
Edition 1;
National Edition

Pick of the paperbacks

SECTION: CULTURE;FEATURES; Pg. 50

LENGTH: 586 words

LEVIATHAN, OR THE WHALE by PHILIP HOARE Fourth Estate £8.99

Ever since Jonah found himself stuck in the belly of one, whales have been an epic spur to the human imagination. Hoare has been in awe of these beasts since he first saw a killer whale at a safari park as a child. Now a 50-year-old writer, he counterbalances his life in a London tower block with dreams of whales - finbacks, humpbacks, minkes - but, above all, the sperm whale. Winner of this year's Samuel Johnson prize, this is a WG Sebald-ish narrative, in which thoughts about history and literature combine haphazardly with Hoare's inner life. Ultimately, it functions best as a companion to and exhortation to read Moby-Dick.

Bee Wilson

QUANTUM

by **MANJIT KUMAR** Icon £9.99

Shortlisted for the 2009 Samuel Johnson prize, this is a gripping account of how a group of physicists made a series of mindboggling discoveries about the structure of matter in the early 20th century. In 1900, as an offshoot of Germany's campaign to develop a more efficient light bulb, Max Planck first discovered that energy came in small, indivisible packets - or "quanta". Kumar seamlessly interweaves history and biography with clear explanations of the insights that Einstein and others made into the behaviour of matter at the subatomic level. The result makes you feel that you've grasped not only some of the revolutionary concepts

of 20th-century science but sensed the thrill these physicists must have experienced as they made their world-changing breakthroughs. Robert Collins

ALL OUR WORLDLY GOODS

by IRENE NEMIROVSKY Vintage £7.99

This novel, originally published in 1947, ends, like the first part of Némirovsky's highly acclaimed Suite Française, with the fall of France, but reaches back to the days before the first world war, tracking the lives of four generations of a prosperous family in northern France through war and peace, in love and hatred. Monstrous indifference, the author slyly suggests, is as French as a fresh baguette. Between (even during) world conflict, the little everyday disturbances of life go on, described by Némirovsky in a conversational way that avoids the melodramatic. Penny Perrick

AMERICA AMERICA

by ETHAN CANIN Bloomsbury £7.99

The United States has always been perpetually split between the haves and the have-nots. Set in upstate New York, Canin's novel tells the story of Corey Sifter, a teenager of humble origins who finds work in the late 1960s at Aberdeen West, the estate of the super-rich Metareys. Before long, Corey is made an honorary family member, but his advancement is derailed when he is asked to help cover up a terrible accident. Canin's novel is, at heart, a compelling portrait of the inability of great wealth to create a sanctuary in the surging nation that made prosperity possible. Stephen Amidon

RESISTANCE: Memoirs of Occupied France

by AGNES HUMBERT Bloomsbury £8.99

This spirited first-hand account of the second world war was written in 1946 by an art historian who was one of the first to join the resistance against Hitler, was betrayed to the Gestapo in 1941 and then spent much of the rest of the war scrabbling for survival as a slave worker in Germany. It is an astonishingly vivid testament to one woman's bravery, humanity and sheer dogged resilience and, more than any number of academic tomes, allows us to understand the visceral reality of life in this torrid period of history. Andrew Holgate

All available at BooksFirst prices (including p& p) on 0845 271 2135 and timesonline.co.uk/booksfirst

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JOURNAL-CODE: STS

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Arts & Book Review

July 3, 2009
First Edition

True stories and lost lives;
Does Philip Hoare's victory in the Samuel Johnson Prize with a whale of a tale confirm that formal biography is now a dying art? Boyd Tonkin reports

BYLINE: Boyd Tonkin

SECTION: BOOKS; Pg. 26

LENGTH: 1779 words

In spring 2001, Philip Hoare published Spike Island, an eerie and evocative history of a military hospital near his Southampton home and the sad secrets that it harboured. After its release, he got an admiring letter from the very writer whose inspiration lay behind the work. To receive the compliments of WG Sebald, Hoare told me on Tuesday after he had won the BBC Samuel Johnson Prize for non-fiction with his latest book, Leviathan, or The Whale, "was like getting a fan letter from EM Forster". Too soon, Sebald died in a road accident in Norfolk. Since then, the posthumous influence of the unclassifiable, genre-crossing German author who lived and taught in Norwich for more than 30 years has never ceased to grow.

Leviathan is Hoare's extraordinary, multi-dimensional quest for the whale through memoir, biography, zoology, history, travel and - of course - the fictional monster of Herman Melville's Moby-Dick. It richly embodies the new directions in narrative that Sebald took himself, and opened up for others. Hoare had written biographies of Noel Coward and the aesthete Stephen Tennant before The Rings of Saturn, Sebald's mesmerising tour through the myth and history of coastal East Anglia, struck him like a thunderbolt.

Of course, other writers had already shown that non-fiction narrative could evolve into a skittish mongrel beast. This hybrid style of storytelling mingled its literary bloodlines, dramatised the author and - crucially - threw off the tight leash of cradle-to-grave biography, cause-and-effect history or neutral travel reportage. Pioneers such as Iain Sinclair and Bruce Chatwin had also broken acres of fresh ground.

Yet it was the drily witty German expatriate who helped Hoare escape from the chafing fetters of conventional biography. "It has been his spirit and encouragement that freed me from the constraints that I'd felt myself labouring under," he says. Researching Noel Coward, Hoare had felt caught up in a grinding machine of anecdote, rivalry and recollection. "I met people like Katharine Hepburn and Gore Vidal, who were still rehearsing old feuds. You realise that you just become part of this ongoing fabrication."

He became "very frustrated by the supposed objectivity of writing history or biography". The thinking and feeling self that gets to swim - ecstatically - with the whales in Leviathan clamoured to be let back into Hoare's work. As his investigation spanned forms - from childhood memories and cetacean biology to literary criticism and biography - as well as continents and oceans, he knew that the book had to move around as freely and fearlessly as the superlative beasts it evokes. "I had to write it in a very personal, passionate, eclectic and madly digressive way. There's no structure to this book. It happened as it happened."

In non-fiction, such free-style fluidity now seems to net the spirit of a restless age. In contrast, orthodox biography - for so long a bankable jewel in the crown of British publishing - has entered stormy waters. No "straight" biography of a major figure has won the Samuel Johnson Prize since TJ Binyon's life of Pushkin in 2003. Victors since then have included Jonathan Coe's experimental, semi-fictionalised life of the avant-garde novelist BS Johnson, James Shapiro's microscopic study of Shakespeare through one landmark

year, 1599, and Kate Summerscale's Victorian true-crime mystery, The Suspicions of Mr Whicher. All, like Leviathan itself, shunned the chronological slog to exploit the new territories that non-fiction has occupied since big-name biography began to lose its bloom.

This year, some of the season's best-received lives - Jackie Wullschlager on Marc Chagall, Philip Norman on John Lennon, Gerald Martin on Gabriel García Márquez, Julian Evans on Norman Lewis - did not even reach the Samuel Johnson longlist. In contrast, three titles on a science-heavy shortlist - Richard Holmes's The Age of Wonder, **Manjit Kumar's** Quantum and Liaquat Ahamed's Lords of Finance - adhered to the now-favoured format of the group biography that weaves the linked stories of friends, rivals or colleagues.

Michael Holroyd's 1967-68 life of Lytton Strachey is often seen as the inaugural act of a golden age in biography. It set the tone for later works that allied the full and frank disclosure of private lives with storytelling skills to win commercial and critical success. Last year, though, even Holroyd joined the drift away from the single-focus blockbuster. Instead, he wrote about the conjoined careers on and offstage of actors Henry Irving and Ellen Terry - and their tangled families - in A Strange and Eventful History.

Perhaps the balance of achievement has not shifted. The balance of fashion definitely has. In terms of advances offered, sales expected and excitement generated, large-scale biography in the full-dress, life-and-times, warts-and-all mode seems to have passed its peak.

Yet the post-Holroyd heyday - with towering talents such as Graham Robb, Claire Tomalin, Jenny Uglow and Richard Holmes among its luminaries - can still cast a lingering glow. Look at the autumn schedules for 2009 and any transition in taste will not be obvious. Biography will still put on a brave face: John Carey on William Golding; Selina Hastings on Somerset Maugham; Michael Slater on Dickens; Ion Trewin on Alan Clark; William Shawcross's authorised life of the Queen Mother.

However, for DJ Taylor - the biographer of William Thackeray and George Orwell - each of these high-profile lives counts as a special case. "It's against the trend. There are very good reasons for all of these books". Golding, for instance, was "the one major figure of the postwar era" lacking a big "Life". The coming cluster "hasn't anything to do with a renaissance of the art".

Taylor believes that, for the 20th century at least, almost all the ranking figures now have a worthy monument. The novelist Anthony Powell, a prominent exception, has the award-harvesting biographer Hilary Spurling on his case. In a post-heroic period when it feels as if "everyone who matters has been done", authors search for attractive second-division figures. Attendant lords may illuminate their age. "You've got to find someone who's on the margins," Taylor says, "but can be sold to the public for quirkiness and charm."

Elsewhere, new-wave life-writing has pushed speculation beyond the limits of the documents until it almost slips into outright fiction. It has crept up on famous names from the side entrances to their lives rather than knocking on the front door. It has shifted its spotlight from the stars centre-stage to the extras chatting in the wings. It has given the biographer a leading role in the pursuit of a quarry. Above all, it has sought to tell a breathing story rather than dump a dead weight of data in the reader's lap. Whether tracing the model for Robinson Crusoe into the sea-mists of rumour, or deducing Shakespeare's daily round from faint echoes in the archives, Diana Souhami and Charles Nicholl - quoted below - exemplify this hunt for a truth about the elusive past that burrows beyond the "facts".

Not all biographers can detect a decline in the genre. Next week Hermione Lee, who has written lauded lives of Virginia Woolf and Edith Wharton, publishes a study of biography in Oxford's "Very Short Introductions" series. For Lee, the "popularity and ubiquity" of biography - in British culture anyway - may provoke a sporadic backlash against intrusion and exposure.

Yet "predictions of doom from the publishing industry about 'the death of biography'" should carry no more clout than prophecies of "the death of the novel". And if the art mutates - fewer heavyweight portraits, more mixed-media sketches or avant-garde miniatures - then, for Lee, that means a reversion to older and looser ways of writing lives, in Classical moralists such as Plutarch or post-Renaissance tale-tellers such as gossipy John Aubrey.

Four decades before what Lee calls James Boswell's "garrulous hold-all" of a Life in 1791 made Dr Johnson the archetypal subject of biography, Johnson himself had written a vivid unofficial account of Richard Savage - the penniless wild poet and close friend of his youth. Lee notes that Richard Holmes, in his book Dr Johnson & Mr Savage, argues that Johnson created a "hybrid, 'romantic', non-fictional form, combining drama, romance, folk ballad, journalism and morality".

That doesn't sound so alien to the experiments of a Souhami, a Nicholl or a Sinclair. In its late maturity, the literature of real lives may be shedding girth and grandeur and returning to its more informal roots. As Philip Hoare says about Sebald's mixed-up modes of non-fiction storytelling, "It's like the way we experience culture, art and life. We don't experience life in genres."

New lives for old: biographers who shun the 'womb-to-tomb' story

Quality: that's what matters - imagination, wit, style, narrative pace, conceptual underpinning and feeling drawn to the authorial voice as well as the subject matter. I hope the huge one-damn-thing-after-another biography, where the biggest crime is to omit a reference, has had its day. I'd like the same expectation of literary quality to be applied to biography as to fiction: the same desire for innovation, range and surprise. In 'Coconut Chaos', I crossed genres and moved between fiction, biography, autobiography, history and adventure. In the shops, the book ended up in Travel, where only the devoted could find it. I don't see why one biographical form should live at the expense of another. Nor is any individual definitively "done" - except perhaps Hitler and Diana. I've tried to do something different in each of my books. Not to develop or diverge as a writer - that's boring. Nor is it a good idea to try to conform to what we imagine will sell.

Diana Souhami (author of 'Selkirk's Island', 'Wild Girls' and 'Coconut Chaos').

The traditional "womb-to-tomb" biography has perhaps come to seem rather high-handed and old-fashioned. I think there have been too many 800-pagers, particularly about 19th- and 20th-century figures, where the wealth of surviving documentation makes them unwieldy with superfluous knowledge. These big books also presuppose a readership with a lot of time on its hands. The interest now is in something at once more oblique and more close-focused, something that offers a brief frisson of historical intimacy rather than a grand funeral oration. As Dr Johnson himself noted, the best biographies are "levelled with the general surface of life".

Charles Nicholl (author of 'The Reckoning', 'Leonardo da Vinci: the flights of the mind' and 'The Lodger: Shakespeare on Silver Street').

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The Evening Standard (London)

July 1, 2009 Wednesday

THERE'S NOW A SCIENCE TO WRITING GREAT BOOKS

LENGTH: 625 words

SARAH SANDS *TO BE ADVISED* Judging the Samuel Johnson Prize began as an over-enthusiastic book club ‹ each of us had 40 books to read in three months ‹ and ended in personal transformation. The winning book turned out to be what we first tentatively described as a "strange story about whales".

Why choose Philip Hoare's Leviathan from a long list that included authors such as Simon Schama and Adam Nicolson and subjects as appealing as Casanova and Shakespeare and Pompeii? We had one scientist on the panel of five ‹ Dr Mark Lythgoe, from University College London ‹ yet the short-list was weighted by science-based books: Bad Science by Ben Goldacre; The Age of Wonder: How the Romantic Generation Discovered the Beauty and Terror of Science by Richard Holmes; Quantum; Einstein, Bohr and the Great Debate about the Nature of Reality by **Manjit Kumar.** Plus some biology in Leviathan and botany in Lost City of Z. In the green room before the awards yesterday, Lythgoe was still protesting against the refusal of arts graduates to embrace science. He chuckled over Ben Goldacre's thesis that the media is stuffed with art bias so wilfully restricts science coverage to mad nutritional theories and PR stunts.

Goldacre was a slightly sore point so far as I was concerned. I regarded it as a series of clever columns rather than a narrative and was disappointed not to have got Alexander Waugh's merry biography of the suicidal Wittgenstein family into the top six. So what made this year's great writers turn to science for inspiration and what does it say about our times?

These books are untouched by daily anxiety or cynicism. The public conversation of the past few months has been squabbling politicians and their expenses. So imagine one's soaring spirits to read of Einstein and Bohr discussing, heatedly, night after night, the composition of the universe. As Einstein put it: "I want to know how God created this world. I want to know his thoughts, the rest are details." The prevailing theme of the short list was not science in an academic form but the heroic human quest of discovery. In the case of the wonderful Lost City of Z, by David Grann, this takes the literal form of a journey into the heart of the Amazon to find a hidden city and untangle a mystery. In Quantum, it is a challenge to the master of the universe. Even Lords of Finance, by Liaquat Ahamed, ostensibly about the causes of the Great Depression, turns out to be a heroic tragedy about the men trying to control it. At the award ceremony last night, I spoke to Richard Holmes about his book, the Age of Wonder. He had come within a spit of winning and we had argued between his book and Leviathan ‹ each changing our positions within the discussion ‹ for an entire afternoon. Holmes said that his inspiration was the dreams of youth. His authority on the Romantic poets had led him to the romantic scientists of the 18th century. He had been entranced by Coleridge's notion of a shared colony of poets and scientists to discuss "the stuff of dreams". It was, said Holmes, all about hope.

"Keep true to the dreams of your youth" was the mantra of the cursed Herman Melville, author of Moby Dick and one of many haunting characters in Philip Hoare's book, Leviathan. Whales are not so much the subject as the obsession. Man, whale, life, death. A sea monster that embodies the origins of the earth. After reading

this book I dreamed of sperm whales and awoke with tears on my cheeks.

Life is grand and mysterious and mankind is plucky. This is the message of this year's Samuel Johnson Prize.

Read prizewinner Philip Hoare's Evening Standard article on whales at www.standard.co.uk/whales After reading this book I dreamed of sperm whales and awoke with tears on my cheeks

LOAD-DATE: July 1, 2009

LANGUAGE: ENGLISH

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The Evening Standard (London)

July 1, 2009 Wednesday

WRITER USES PRIZE TO PLEAD FOR ENDANGERED WHALES

BYLINE: LOUISE JURY CHIEF ARTS CORRESPONDENT

LENGTH: 201 words

WRITER Philip Hoare has made an impassioned plea to save the whale after winning Britain's most prestigious prize for non-fiction with a love letter to the world's biggest mammal.

The author won the £20,000 BBC Samuel Johnson Prize with Leviathan, or The Whale. The victory came after a close fight against Richard Holmes's The Age of Wonder.

Hoare, 51, whose previous books include biographies of Noel Coward and aristocrat Stephen Tennant, said: "The biggest problem is the Japanese are threatening to hunt humpback whales. There are genuine concerns that whaling could become commercial again."

Asked how he was going to spend his prize money, he said: "I'm going to go and see more whales, of course."

Leviathan was chosen from a shortlist of six and nearly 170 submissions by a judging panel that included Tim Marlow, of the White Cube art gallery, and Sarah Sands, the Standard's deputy editor.

The other books on the shortlist were Lords of Finance by Liaquat Ahamed, Bad Science by Ben Goldacre, The Lost City of Z by David Grann, and **Manjit Kumar's** Quantum: Einstein, Bohr and the Great Debate About the Nature of Reality.

Sarah Sands Page 13

Sea view: Philip Hoare won with Leviathan, a love letter to whales

LOAD-DATE: July 1, 2009

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newspaper

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The Guardian (London) - Final Edition

July 1, 2009 Wednesday

National: Whale tale wins £20,000 prize for non-fiction

BYLINE: Mark Brown, Arts correspondent

SECTION: GUARDIAN HOME PAGES; Pg. 8

LENGTH: 340 words

A childhood love of Herman Melville's Moby-Dick led to a lifelong passion for whales which, in turn, resulted in the writer Philip Hoare being named winner of the UK's most important prize for works of non-fiction last night.

Hoare's Leviathan or, The Whale, is part natural history, part literary criticism, part economics and part

memoir but at its heart is Hoare's personal lifelong obsession for all things whale.

The chairman of judges for this year's BBC Samuel Johnson prize, the American political journalist Jacob Weisberg, predicted that Hoare's genre-defying book would become a classic. He added: "The quality of his writing was just so impressive; it is literary, just beautiful. It is a model of a certain kind of writing and I imagine it is a book that will be read for a long time to come."

Weisberg, who until last year was editor of Slate, said the judging experience had been enjoyable but trickier than he had expected. "Picking the winner from such strong books felt almost impossible. There was a lot of spirited debate and some disagreement but by the end there was a general consensus," he said.

Hoare, who lives in Southampton, has written books on Oscar Wilde, Noel Coward and the brightest of the Bright Young Things, Stephen Tennant.

He traces his love of whales to reading Moby-Dick and vividly recalls his first actual encounter with a killer whale at Windsor safari park. Hoare frequently travels to Cape Cod as a volunteer on a humpback whale identification programme.

His book saw off competition from a shortlist that also included Ben Goldacre's Bad Science; Liaquat Ahamed's Lords of Finance; David Grann's The Lost City of Z; Richard Holmes's The Age of Wonder; and **Manjit Kumar's** Quantum.

In total, 166 books were submitted to a judging panel that also included neuroscientist Mark Lythgoe, art writer Tim Marlow, journalist Sarah Sands and Boris Johnson's arts chief, Munira Mirza. The £20,000 prize was presented at a ceremony in London last night, with BBC2 broadcasting a special edition of The Culture Show.

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The Associated Press

June 30, 2009 Tuesday

Whale of a tale wins British nonfiction book prize

SECTION: ENTERTAINMENT NEWS

LENGTH: 224 words

DATELINE: LONDON

The story of a man's lifelong obsession with whales won Britain's leading nonfiction book prize Tuesday.

"Leviathan, or The Whale," by British writer Philip Hoare, beat five other finalists to the 20,000-pound ($33,000) Samuel Johnson Prize for Nonfiction.

Inspired by Herman Melville's whale-hunting saga "Moby-Dick," Hoare traces his fascination with the gigantic sea creatures from childhood visits to the Natural History Museum to journeys across the world's oceans.

U.S. journalist Jacob Weisberg, who led the five-judge panel, said Hoare's passion for his subject was infectious and his dreamlike prose "rises to the condition of literature."

Named in honor of the 18th-century essayist and lexicographer, the Samuel Johnson Prize is open to English-language books from any country in the areas of current affairs, history, politics, science, sport, travel, biography, autobiography and the arts.

The other finalists were Liaquat Ahamed's credit-crunch tale "Lords of Finance"; Ben Goldacre's myth-debunking "Bad Science"; David Grann's story of Amazon exploration, "The Lost City of Z"; "Quantum: Einstein, Bohr and the Great Debate about the Nature of Reality," by **Manjit Kumar;** and "The Age of Wonder: How the Romantic Generation Discovered the Beauty and Terror of Science," by Richard Holmes.

On the Net: http://www.thesamueljohnsonprize.co.uk

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PUBLICATION-TYPE: Newswire

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theguardian
Guardian.com

June 30, 2009 Tuesday

Bad Science is good bet for Samuel Johnson prize

LENGTH: 420 words

ABSTRACT

Ben Goldacre's polemical attack on pseudo-science, already a bestseller, is 2/1 favourite to take the non-fiction award

FULL TEXT

Doctor and Guardian journalist Ben Goldacre's attack on pseudo-science is edging into pole position for this evening's Samuel Johnson prize for non-fiction, at least if the way punters are betting in both the bookies and the bookshops is anything to go by.

Goldacre's Bad Science is Ladbrokes's 2/1 favourite to take the ?20,000 prize this evening, ahead of David Grann's investigation into the journey of a British explorer who disappeared in the Amazon in the 1920s, The Lost City of Z, which comes in at 3/1. "It's a two-way battle at the top of the betting between Ben Goldacre and David Grann. And it's the former that has captured the imagination of literary punters," said Ladbrokes spokesman Nick Weinberg.

Bad Science is also out in front in terms of sales, selling more than 94,000 copies to date according to book sales monitor Nielsen BookScan, way ahead of the second best selling title, Richard Holmes's exploration of science in the 18th century, The Age of Wonder. That has racked up almost 18,000 sales to date, and is Ladbrokes's third favourite at 5/1.

Rival bookie William Hill isn't so sure about Goldacre's chances, however, giving him 4/1 odds behind Grann at 3/1 and its favourite, Philip Hoare's Leviathan, at 2/1. "The majority of support has been for Leviathan, and we will be sunk if whale wagers leave us floundering," said William Hill spokesperson Graham Sharpe, grasping for a pun. An intriguing journey into the world of whales, Leviathan has sold 1,747 copies to date, putting it in fifth place in sales terms, behind **Manjit Kumar's** Quantum: Einstein, Bohr and the Great Debate about the Nature of Reality (9,104) and Grann's Amazonian adventure (1,803).

Liaquat Ahamed's Lords of Finance ? which looks at the reasons for the 1929 Great Depression ? brings up the rear at Ladbrokes at 8/1, and, having only been published in April, is also the loser in terms of sales, with 1,079 copies sold to date.

Whether the judges will take punters' views into account remains to be seen: chaired by political journalist Jacob Weisberg, their decision will be announced tonight in a televised awards ceremony on BBC2. The Samuel Johnson prize is the most prestigious award for non-fiction in the UK, with the winner guaranteed a wider readership. Last year's prize was won by Kate Summerscale for her unpicking of a Victorian murder mystery, The Suspicions of Mr Whicher.

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PUBLICATION-TYPE: Newspaper

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theguardian
Guardian.com

June 30, 2009 Tuesday

'Classic' study of whales wins Samuel Johnson prize

LENGTH: 513 words

ABSTRACT

Philip Hoare's Leviathan wins Britain's most important prize for non-fiction

FULL TEXT

A childhood love of Melville's Moby-Dick led to a lifetime passion for whales which, in turn, resulted in the writer Philip Hoare tonight being named winner of the UK's most important prize for non-fiction books.

Hoare's Leviathan is part natural history, part literary criticism, part economics and part memoir but at its heart is the author's lifelong obsession for all things whale.

The chairman of judges for this year's £20,000 BBC Samuel Johnson prize, the American political journalist Jacob Weisberg, predicted that Hoare's genre-defying book would become nothing less than "a classic". He added: "The quality of his writing was just so impressive, it is literary, just beautiful. It is a model of a certain kind of writing and I imagine it is a book that will be read for a long time to come."

Weisberg, who until last year was editor of Slate, said the judging experience had been enjoyable but trickier than he had anticipated. "The judging process was extremely difficult and got more difficult as time went on. We had 19 books on the longlist and no-one felt terribly bad about what was left off and even on the shortlist of six, it was difficult but not impossible. Picking the winner from such strong books felt almost impossible. There was a lot of spirited debate and some disagreement but by the end there was a general consensus."

Hoare, who lives in Southampton, has previously written books on figures including Oscar Wilde, Noël Coward and the brightest of the Bright Young Things, Stephen Tennant.

He traces his love of whales to reading Moby-Dick and vividly recalls his first actual encounter with a killer whale at Windsor safari park. Hoare now frequently travels to Cape Cod as a volunteer on a humpback whale identification programme.

Hoare's book saw off competition from a shortlist that also included Ben Goldacre's book version of his Guardian column Bad Science, which Ladbroke's had installed as 2/1 favourite. The others were Liaquat Ahamed's Lords of Finance, an examination of the Great Depression; David Grann's The Lost City of Z, about the British explorer Percy Fawcett who disappeared in the Amazon in 1925; Richard Holmes's The Age of Wonder, in which he links a series of biographies on 18th century scientists; and a book praised for making quantum physics accessible and interesting - **Manjit Kumar's** Quantum.

In total, 166 books were submitted to a judging panel that also included neuroscientist Mark Lythgoe, art writer Tim Marlow, journalist Sarah Sands and Boris Johnson's arts chief Munira Mirza. The reading was split up between the judges with Weisberg properly reading nearly 40 and dipping in to many more - "my mind is now overflowing with pedantic facts," he admitted.

"But I enjoyed it so much. I was sort of thinking with the books that I'll read a chapter and discard it but most of them are so good that you kept on reading. It's meant to be that fiction is escapist in a way that non-fiction

isn't. That ceased to be true for me."

LOAD-DATE: June 30, 2009

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newspaper

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PRESS ASSOCIATION
Press Association Mediapoint

June 30, 2009 Tuesday 7:57 PM BST

WHALE BOOK WINS LITERARY AWARD

BYLINE: Vicky Shaw, Press Association Arts Correspondent

SECTION: HOME NEWS

LENGTH: 603 words

Philip Hoare's book charting his lifelong obsession with whales was tonight named the winner of the BBC Samuel Johnson Prize for Non-Fiction 2009.

Leviathan, Or The Whale was described by judges of the £20,000 accolade as containing ``dream-like'' prose.

Based in Southampton, Hoare's previous books include the biographies Serious Pleasures: The Life Of Stephen Tennant and Oscar Wilde's Last Stand.

In Leviathan, he seeks to identify why he is in awe of whales, from viewing the gigantic models at London's Natural History Museum to adult encounters with wild whales in the flesh.

He delves into the heart of his fascination with Moby-Dick, the 19th century book by Herman Melville from which he drew inspiration.

The author often visits Cape Cod as a member of the Provincetown Centre for Coastal Studies as a volunteer on its humpback whale identification programme.

The chair of the judges, political journalist Jacob Weisberg, announced the winner at a ceremony in London.

He said: ``What made Leviathan stand out in a shortlist of wonderful reads was Philip Hoare's lifelong passion for his subject and his skill in making his readers share it.

``His prose is dream-like and rises to the condition of literature.''

Hoare told the Independent last year that he had been described as a ``whale stalker''.

The prestigious award is described as the ``richest non-fiction prize in the UK''.

It is open to authors of all non-fiction books in the areas of current affairs, history, politics, science, sport, travel, biography, autobiography and the arts.

This year's shortlist has been described as being dominated by science.

Those who were in the running were Lords Of Finance, by Liaquat Ahamed; Bad Science, by Ben Goldacre; The Lost City Of Z, by David Grann; The Age Of Wonder: How The Romantic Generation Discovered The Beauty And Terror Of Science, by Richard Holmes; and Quantum: Einstein, Bohr And The Great Debate About The Nature Of Reality, by **Manjit Kumar.**

Others on the judging panel were Dr Mark Lythgoe, neuroscientist at University College London and director of the Cheltenham Science Festival; Tim Marlow, writer, broadcaster and art historian and director of exhibitions at White Cube; Munira Mirza, director of policy, arts, culture and the creative industries at the mayor of London's office; and Sarah Sands, deputy editor at the London Evening Standard.

Last year's winner was The Suspicions Of Mr Whicher, by Kate Summerscale.

The BBC is showing coverage of the prize on a special edition of BBC2's The Culture Show, which is broadcast tonight at 11.20pm.

Hoare said he was ``completely discombobulated by the whole thing''.

``It's the first prize I've ever won so it's pretty extraordinary from that point of view,'' he said. ``When I made it on to the long-list I thought 'wow, that's great and that will be the end of that'.

``When my editor said I was on the shortlist I uttered a few profanities!''

He planned to spend the prize money on a trip to see more whales. he added.

``I'm totally obsessed. It's very addictive. The more you see them the more you want to see them.

``I think I'm going to have to do another book about them.''

Explaining the appeal of the book, he said: ``Everyone loves whales because there's such a mystery about them. I still don't completely understand them.

``I think everyone's fascinated by them. When you look a whale in the eye you realise it's a sentient creature. It kind of understands you, and that's disconcerting.''

But there was also a sense of guilt about whales, he argued.

``We're very lucky they're still around because we've driven them almost to extinction,'' he said.

LOAD-DATE: July 1, 2009

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newswire

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The Express

June 26, 2009 Friday
U.K. 1st Edition

Science and wonder take the prize; WEEKEND BOOKS The only major prize for a non-fiction work will be awarded next week and the shortlist inevitably reÕects a wide variety of subjects and approaches. CHRISTOPHER SILVESTER takes a look

SECTION: COLUMNS; 52

LENGTH: 616 words

THE BBC Samuel Johnson Prize started (without the BBC prefix) in 1999, when Antony Beevor's groundbreaking and vivid military history Stalingrad took the laurel. Since then the winners have included four biographies, three political histories and one work of contemporary political reportage.

Last year's winner The Suspicions Of Mr Whicher: Or The Murder At Road Hill House, by Kate Summerscale, was not in any of these categories. An examination of the 1860 murder in a Wiltshire country house that inspired the modern cultural phenomenon of detective fiction, Summerscale's book seemed to have the right combination of quirkiness, intellectual weight and accessibility.

This year's shortlist of six books is dominated by science, or the relationship between science and culture.

Four of the books fall within this broad subject. Three of the titles can be described as collective biographies, one of which covers the most dramatic and consequential episode in 20th-century financial history.

Ben Goldacre's book Bad Science (HarperPerennial, GBP 8.99) targets the antics of scaremongering pharmaceutical companies, fraudulent alternative practitioners and lazy and supine sections of the media that are seemingly eager to be fooled by them. Described as compelling reading by the New Scientist, Goldacre's book combines scientific scepticism and passionate indignation with plenty of humour.

Richard Holmes's The Age Of Wonder (Harper Press, GBP 25) focuses on the pioneering 18th-century scientists who had such a powerful influence on the Romantic writers and artists that came behind them.

Another group of scientists, the 20th-century quantum physicists, whose bold thinking, despite some of its philosophical absurdities, formed the basis of much modern technology, are the subject of **Manjit Kumar's**

Quantum (Icon, GBP 9.99).

Slightly out on a limb from the other books is The Lost City Of Z (Simon & Schuster, GBP 16.99), by New Yorker staff writer David Grann.

This tells the story of Colonel Percy Harrison Fawcett who vanished in the Amazonian jungle in the Twenties while on a vainglorious quest for a lost civilisation - an adventure story with nods towards archaeology and anthropology.

From a book about obsession to a book by an obsessive: Philip Hoare, otherwise a biographer of aesthetes, has dreamed about whales swimming around his ninth-floor flat and even fantasised about belonging to their world. His Leviathan (Fourth Estate, GBP 8.99) details the biological mysteries of the whale but also its peculiarity as a source of cultural fascination.

Indeed, it encompasses so many different aspects of whale lore that it is the hardest of the shortlisted titles to categorise.

Educated at Cambridge and Harvard, Liaquat Ahamed is an investment manager by profession, based in New York. In Lords Of Finance (Heinemann, GBP 20) he has written a captivating study of the four central bankers (from Britain, Germany, France and the US) whose failure of intellectual will pitched the world from a financial crisis into the catastrophe of the Great Depression of the Thirties. It is a sparkling example of financial history that never loses sight of the human element.

The winner of the prize will be announced next Tuesday evening and the awards ceremony will be broadcast on BBC2 at 11.20pm that night as a special edition of The Culture Show.

My hunch - and it can only be a hunch - is that it will ultimately be down to a choice between three books, Bad Science, Leviathan and Lords Of Finance, with the latter just nosing ahead of the others.

Financial history rarely gives rise to such a highly readable treatment and this year of all years seems the right moment for the genre to be recognised.

LOAD-DATE: June 27, 2009

LANGUAGE: ENGLISH

GRAPHIC: PRINCE OF WHALES: Majestic orcas are a source of cultural fascination

PUBLICATION-TYPE: Newspaper

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June 25, 2009 Thursday

BBC Samuel Johnson Prize For Non-Fiction

SECTION: ENTERTAINMENT

LENGTH: 84 words

BBC Samuel Johnson Prize For Non-Fiction awards ceremony. Shortlisted titles are 'Lords of Finance' by Liaquat Ahamed, 'Bad Science' by Ben Goldacre, 'The Lost City of Z' by David Grann, 'Leviathan' by Phillip Hoare, 'The Age Of Wonder: How The Romantic Generation Discovered The Beauty & Terror of Science' by Richard Holmes & 'Quantum: Einstein, Bohr & The Great Debate About The Nature of Reality' by **Manjit Kumar**

Start date: 2009-06-30

End date: 2009-06-30

Event URL: http://www.thesamueljohnsonprize.co.uk/

LOAD-DATE: July 23, 2009

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newspaper

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The Guardian (London) - Final Edition

June 21, 2009 Sunday

Review: Books: PAPERBACK OF THE WEEK: It's time to get physical: Quantum: Einstein, Bohr and the Great Debate About the Nature of Reality, Manjit Kumar Icon Books £9.99

BYLINE: SOPHIA MARTELLI

SECTION: OBSERVER REVIEW BOOKS PAGES; Pg. 25

LENGTH: 334 words

Crammed with - what would the collective noun be? An array; a density; a mass? - of the 20th century's most brilliant physicists, **Manjit Kumar's** extensive intellectual history of quantum physics describes not just the ideas that revolutionised the way we understand the world, but also the scientists (Planck, Einstein, Bohr, Pauli, Heisenberg, Shrodinger et al) who generated them. He discusses their relationship to one another and puts it all in historical context. It's a feat of true scholarship interspersed, thankfully, with moments of more accessible entertainment. The result is a book of such ambition that it has been shortlisted for the Samuel Johnson Prize for non-fiction.

Kumar takes a detective story approach - though Quantum is more brain-spraining than any thriller. The first in a series of plot twists is Planck's 1900 discovery of his "h" constant. Although it was not regarded as significant at the time, Einstein grasped in 1905 that Planck's find suggested light might be made up not of waves, but particles.

The quantum theory debate soon expanded from light to cover all matter and even time. With the addition of Heisenberg's uncertainty principle and Shrodinger's cat, many scientists came to the conclusion that there is no such thing as objective reality. Letting go of a classical, causal notion of physics defeated some of the biggest names in the business, Einstein included; he didn't accept Bohr's "Copenhagen interpretation" of 1927, and the account of their thought experiment "duels" is one of the highlights of the book.

Kumar conveys the bewilderment and tension of the decades-long period during which this debate raged; one scientist is quoted as saying: "The confusion of ideas reached its zenith" in 1927. Thanks to Kumar's lucid writing, the lay reader doesn't suffer the same fate, and while not all the carefully laid out mathematics are easily comprehensible, there are plenty of Eureka moments to encourage even the most physics-resistant reader to keep going.

LOAD-DATE: June 22, 2009

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newspaper

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Manchester Evening News

June 18, 2009 Thursday

SECTION: BUSINESS; Pg. 3

LENGTH: 107 words

Name Derek John Duffill

Age 57

First job Test engineer

How long is your working day? 11 to 13 hours

Worst mistake ever made? Waiting until I was 27 to travel internationally.

Where is your favourite restaurant, and why? Yang Sing, Manchester for quality and service

Last book read Quantum, by **Manjit Kumar**

What is parked in your driveway? Mercedes E280 and Honda Fireblade

Which celebrity would you most like to be stranded on a desert island with and why? Suzi Perry - she likes bikes, gadgets and looks great.

Where do you holiday? Africa, Ireland, Cyprus.

Best achievement Building my last company from £8m to over £100m, and winning company awards.

LOAD-DATE: January 1, 2010

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newspaper

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The Telegraph
telegraph.co.uk

May 28, 2009 Thursday 11:45 AM GMT

Samuel Johnson Prize: the shortlist

BYLINE: By Sameer Rahim

SECTION: BLOG

LENGTH: 326 words

The BBC Samuel Johnson Prize for non-fiction is probably the strongest book prize around. A glance at the winners from the last few years, which have included Anna Funder's Stasiland, Jonathan Coe's biography of BS Johnson and James Shapiro's book on Shakespeare, shows that significant and unusual books have been chosen. In comparison to the Man Booker Prize winners - well, I can barely remember who they are.

Last year's shortlist was incredibly strong: Patrick French's Naipaul biography or Alex Ross's book on modern classical music would have been worthy winners. The Telegraph boasted two contenders: our Middle East editor Tim Butcher's Blood River and, the eventual winner, former literary editor Kate Summerscale's The Suspicions of Mr Whicher.

This year's shortlist (announced this week) is less literary and more oriented towards science with a nod to economic history. They are Bad Science by Ben Goldacre, The Lost City of Z by David Grann, Leviathan by Philip Hoare, The Age of Wonder by Richard Holmes, Quantum by **Manjit Kumar** and Lords of Finance by Liaquat Ahamed.

This is a solid and worthwhile list, though I was surprised to see that Ahmed Rashid's Descent into Chaosor Graham Farmelo's The Strangest Mandid not even make the longlist. Tip for the winner? Quantum and Lords of Finance - rather like previous nominations such as Tony Judt's Post-war and Alex Ross's The Rest is Noise - are, I suspect, there to bolster the prize's seriousness, rather than actually contend for the prize. Leviathan will probably prove too esoteric.

Given the massive success of Kate Summerscale's book, I suspect that the judges will feel under pressure to come up with another commercial hit. So put your money on Ben Goldacre (whose bandwagon continues apace - mostly deserving) or, since everyone loves a mad colonial adventurer, David Grann's The Lost City of Z. The winner is announced on June 30 and the ceremony will be broadcast live on BBC television.

LOAD-DATE: November 8, 2012

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Web Publication

JOURNAL-CODE: WEBDTB

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The Evening Standard (London)

May 21, 2009 Thursday

BAD BANKERS AND DODGY SCIENCE IN THE RUNNING FOR BEST NON-FICTION

LENGTH: 413 words

SRI CARMICHAEL

A BOOK offering lessons from history on how a few bankers can bankrupt the world made it onto the shortlist of Britain's most prestigious non-fiction prize today.

The six-strong shortlist for this year's Samuel Johnson prize covers topics ranging from finance to science and exploration.

Lords of Finance by Liaquat Ahamed quashes received wisdom that the economic crash of 1929 was the result of a "perfect storm" of events beyond anyone's control. It blames the Great Depression on a small group of financiers whose decisions had monumental and far-reaching impact.

Scientific scaremongering is tackled in Bad Science by Ben Goldacre who says our obsession with health provides fertile ground for dodgy myths to be sown. He dismantles some of the less-than-reliable research and misleading use of statistics behind drug trials, court cases and media reports.

A tale of the Amazon's discovery by David Grann, called The Lost City of Z, harks back to days when the rainforest around the world's longest river remained unseen by human eyes and a British explorer's quest to find an El Dorado-like city.

Leviathan by Philip Hoare focuses on man's obsession with the whale, whose nature is still elusive.

Richard Holmes imagines the excitement that swept through the scientific community in the 18th century as a stream of discoveries and inventions awed society. The Age of Wonder looks at how some of the enlightenment's great writers and poets responded to the rapid broadening of their knowledge and imaginations.

Lastly, Quantum: Einstein, Bohr and the Great Debate About the Nature of Reality by **Manjit Kumar** looks at how quantum theory has given us a clearer understanding of the universe and the real story behind the Big Bang. The winner of the prize, in its 11th year, will be awarded £20,000 at a ceremony on 30 June. Chairman of the judges, Jacob Weisberg, said: "All of us were won over by the kinds of books we ordinarily might not have picked up ‹ and now feel lucky to have read." It's not just like choosing between apples and oranges, peaches and pears, writes David Sexton, Literary Editor. This prize requires the judges somehow to compare wholly different species of book. Nonetheless, the Johnson is one of the few literary prizes that seems not just vaguely a good thing but strictly necessary. To write non-fiction well requires no less art than a novel or collection of poetry ‹ and for10 years now, this prize has helped to focus attention on the best.

LOAD-DATE: May 21, 2009

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newspaper

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Guardian.com

May 21, 2009 Thursday

Big names edged out in science-heavy Samuel Johnson prize shortlist

LENGTH: 452 words

ABSTRACT

Shortlist for the £20,000 prize for non-fiction books shows strong bias towards 'scientific discovery and scientific malpractice'

FULL TEXT

The big beasts of the non-fiction jungle have been elbowed aside in the Darwinian struggle for the BBC Samuel Johnson prize, with no space for celebrated writers such as Michael Holroyd, Alain de Botton and Andre Brink on a shortlist dominated by science.

"Only one of this year's judges is a scientist, but all of us were won over by books about scientific discovery and scientific malpractice," said chair of the judges and American political journalist Jacob Weisberg. His fellow judge Tim Marlow, writer and director of exhibitions at White Cube, agreed. "It was pretty much unanimous - certain books did emerge from the longlist, and it's both to the credit of the judges and the strength of the writing around science that these are books that people might not have thought of to begin with."

Guardian journalist Ben Goldacre's dissection of dodgy science is up against a history of quantum theory from **Manjit Kumar** for the £20,000 prize, while Richard Holmes's The Age of Wonder, which explores the scientific discoveries of the late 18th century, also makes the list. Philip Hoare's Leviathan runs the gamut from literary history to nature writing, while David Grann's retracing of the journey of a British explorer who vanished in the Amazon in 1925, The Lost City of Z, treks along the borders of anthropology and archaeology, leaving Liaquat Ahamed's timely unpicking of the causes for the 1929 Great Depression, Lords of Finance, as the only definitively unscientific title on the list.

"There's a little comparison with [last year's winner] The Suspicions of Mr Whicher and The Lost City of Z - a certain element of a mystery being unravelled," said Marlow. "But it's very much its own book - a fantastic historic journey of mystery." Goldacre's Bad Science, meanwhile, is "a very compelling, well written, funny book, as well as one which makes your eyebrows rise. I believe completely that you might as well use Vaseline for moisturiser, but as a fully signed up member of male moisturising society I'm sticking with my brand."

All six books, Marlow said, have a "genuine chance" of winning on 30 June. "I think it's clear there's going to be quite a lot of dispute and a lot of support for a number of these books," he added.

The shortlist:

Lords of Finance by Liaquat Ahamed

Bad Science by Ben Goldacre

The Lost City of Z by David Grann

Leviathan by Philip Hoare

The Age of Wonder: How the Romantic Generation Discovered the Beauty and Terror of Science by Richard Holmes

Quantum: Einstein, Bohr and the Great Debate about the Nature of Reality by **Manjit Kumar**

LOAD-DATE: May 22, 2009

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newspaper

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States News Service

May 21, 2009 Thursday

ROYAL SOCIETY PRIZE FOR SCIENCE BOOKS LONGLIST ANNOUNCED

BYLINE: States News Service

LENGTH: 444 words

DATELINE: LONDON

The following information was released by The Royal Society:

The longlist for this year's Royal Society Prize for Science Books the world's most prestigious award for science writing has been announced today. The judges selected a longlist of thirteen books:

What the nose knows: The science of scent in everyday life by Avery Gilbert (Crown Publishers)

Bad science by Ben Goldacre (Harper Perennial)

The Age of Wonder: How the Romantic generation discovered the beauty and terror of science by Richard Holmes (HarperPress)

Living with Enza: The forgotten story of Britain and the great flu pandemic of 1918 by Mark Honigsbaum (Palgrave Macmillan)

Quantum: Einstein, Bohr and the great debate about the nature of reality by **Manjit Kumar** (Icon Books)

Strange fruit: Why both sides are wrong in the race debate by Kenan Malik (Oneworld Publications)

Decoding the heavens: Solving the mystery of the world's first computer by Jo Marchant (William Heinemann)

The drunkard's walk: How randomness rules our lives by Leonard Mlodinow (Allen Lane, Penguin Press)

Physics for future presidents: The science behind the headlines by Richard A Muller (WW Norton)

Your inner fish: The amazing discovery of our 375-million-year-old ancestor by Neil Shubin (Allen Lane, Penguin Press)

Ice, mud and blood: Lessons from climates past by Chris Turney (Palgrave Macmillan)

Microcosm: E. coli and the new science of life by Carl Zimmer (William Heinemann)

The universe in a mirror: The saga of the Hubble Space Telescope and the visionaries who built it by Robert Zimmerman (Princeton University Press)

Professor Sir Tim Hunt FRS, Chair of the judges said: "We were surprised and delighted at the quality of books and the diversity of subjects, and greatly enjoyed reading and discussing them. In the end we found it impossible to whittle it down to the traditional long-list of twelve, going instead for a baker's dozen fascinating and diverse potential winners. Choosing a shortlist, let alone awarding the prize, is a daunting prospect."

This year's longlist is made up of authors all of whom are new to the prize.

The judges on the judging panel are: Sir Tim Hunt FRS, Cancer Research UK and Nobel laureate (Chair); Dr Maggie Aderin-Pocock, space scientist at Astrium Ltd, STFC Fellow of University College London and Founder and MD of Science Innovation Ltd; Dr Phillip Ball, author; Deborah Cohen, Editor, BBC Radio Science Unit; Danny Wallace, author, comedian and presenter.

The shortlist will be announced on Thursday 25th June 2009. The winner will be announced at a ceremony at the Royal Society on 15 September 2009 and awarded 10,000. The authors of each shortlisted book will receive 1000.

LOAD-DATE: May 26, 2009

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newswire

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theguardian
Guardian.com

May 14, 2009 Thursday

Science dominates Samuel Johnson prize longlist

LENGTH: 850 words

ABSTRACT

'Tremendously wide-ranging' longlist covers everything from quantum theory to quack medicine

FULL TEXT

Samuel Johnson himself would, no doubt, have been delighted: a biography of his sparring partner and confidante, the woman he referred to as his "dear Mistress", is in the running for the literary award named in his honour.

The £20,000 BBC Samuel Johnson prize today announced its 19-strong longlist, which pits Ian McIntyre's biography of Hester Thrale - one of the first female historians and a biographer of Johnson loathed by Boswell, who described her as "a little artful impudent malignant devil" - against heavyweight Michael Holroyd's first major biography in 15 years, Alain de Botton's take on the world of work, and Richard Holmes's exploration of the scientific fever which gripped Britain at the end of the 18th century.

A strong scientific flavour dominates this year's candidates for the UK's most prestigious non-fiction award, with Holmes's historical take joined by Guardian journalist Ben Goldacre's dismantling of pseudo-science, Steve Jones's look at Charles Darwin's lesser-known writings, and **Manjit Kumar's** history of quantum theory and the conflict between Einstein and Bohr over the nature of reality. Patricia Fara also makes the running with a 4,000-year history of science, while scientist Elizabeth Pisani is in contention for The Wisdom of Whores, an insider's view of the 10 years she spent working in the Aids industry.

"Having a scientist on the panel really helped," said judge Sarah Sands, deputy editor of the London Evening Standard, of her fellow judge Dr Mark Lythgoeat, director of the Cheltenham Science festival. "Science has maybe been unrepresented in the past, so we've got slightly fewer traditional biographies."

The longlist was, said Sands, "tremendously wide-ranging", with all five judges keen to select books with a "driving narrative ... books we really couldn't put down, that were a delight". "I've particularly loved the sense of breadth and adventure. I think writers have been less formulaic - actually they've been very bold. Instead of thinking 'what's sold before, let's do a book like it - you would have thought there would have been lots of books about Victorian detectives - in fact people have followed their passions so we've got a book about whales and one about a great explorer."

Quirkier titles selected by judges, chaired by political journalist Jacob Weisberg, include Sara Maitland's memoir about her quest for quiet, A Book of Silence, and Philip Hoare's lovingly received Leviathan, his personal odyssey into the world of whales. The Lost City of Z by David Grann, meanwhile, is a retracing of the journey of one of the last great British explorers, Colonel Fawcett, who disappeared without trace in the Amazon.

Prize-winning South African writer Andre Brink's is the only autobiography to make the line-up; Brink's A Fork in the Road details his upbringing in the heartlands of South Africa, his work against apartheid and his remarkable literary career.

A record number of entries - 166 - were submitted for the prize; Sands promised that she had "bloody well read them all, and I'm never going to read a book again". Weisberg said the 19 selected for the longlist were "fruit of a collective reading spree that I think I can say we've all enjoyed tremendously", and with each title having "passionate advocates" on the judging panel, he knew "how difficult it is going to be for us to whittle down to the shortlist over the next month". The shortlist will be announced in late May, with the winner revealed on 30 June in a televised awards ceremony on BBC2.

Last year's prize was won by Kate Summerscale's The Suspicions of Mr Whicher, with previous winners including Antony Beevor and Jonathan Coe.

The longlist in full:

Lords of Finance by Liaquat Ahamed (William Heinemann)

Soul of the Age: The Life, Mind and World of William Shakespeare by Jonathan Bate (Viking)

Pompeii by Mary Beard (Profile Books)

A Fork in the Road by Andre Brink (Harvill Secker)

The Pleasures and Sorrows of Work by Alain De Botton (Hamish Hamilton)

Science: A Four Thousand Year History by Patricia Fara (Oxford University Press)

Bad Science by Ben Goldacre (Fourth Estate)

The Lost City of Z by David Grann (Simon and Schuster)

Leviathan by Philip Hoare (Fourth Estate)

The Age of Wonder: How the Romantic Generation Discovered the Beauty and Terror of Science by

Richard Holmes (HarperPress)

A Strange Eventful History: The Dramatic Lives of Ellen Terry, Henry Irving and their Remarkable Families by Michael Holroyd (Chatto)

Darwin's Island by Steve Jones (Little, Brown)

Quantum: Einstein, Bohr and the Great Debate About the Nature of Reality by **Manjit Kumar**

(Icon Books)

The Man Who Invented History by Justin Marozzi (John Murray)

Hester: the Remarkable Life of Dr Johnson's 'Dear Mistress' by Ian McIntyre (Constable)

A Book of Silence by Sara Maitland (Granta)

Sissinghurst: An Unfinished History by Adam Nicolson (HarperPress)

The Wisdom of Whores by Elizabeth Pisani (Granta)

The House of Wittgenstein by Alexander Waugh (Bloomsbury)

LOAD-DATE: May 14, 2009

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newspaper

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New Scientist

April 25, 2009

Paperback Picks;
Our editors select the best in softcover reading

BYLINE: Eleanor Harris

SECTION: OPINION; Books & Arts; Pg. 45

LENGTH: 158 words

1

Bad Science

Ben Goldacre

Harper Perennial

£8.99

An updated edition of "one of the essential reads of the year" according to reviewer**Michael Bond**

2

Head Trip

Jeff Warren

Oneworld

£10.99

An endearing first-person account of the various states of consciousness

3

Physics of the Impossible

Michio Kaku

Anchor Books

$15.95

"An easy-to-read physics primer in disguise" said our reviewer**Michael Brooks**

4

My Stroke of Insight

Jill Bolte Taylor

Hodder

£8.99

The incredible story of the neuroscientist who rebuilt her own mind after suffering a severe stroke

5

ID

Susan Greenfield

Sceptre

£8.99

How 21st century technologies might alter the minds of future generations

6

Quantum

Manjit Kumar

Icon Books

£9.99

A vivid account of the people behind the debate over the nature of reality

7

The Drunkard's Walk

Leonard Mlodinow

Penguin

£9.99

An engaging guide to the randomness of our everyday lives

For these reviews and more, check out Books & Arts online at www.newscientist.com/books-art

LOAD-DATE: April 24, 2009

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Magazine

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THE TIMES
The Times (London)

April 11, 2009 Saturday
Edition 1

nonfiction; paperbacks

BYLINE: Anjana Ahuja

SECTION: SATURDAY REVIEW;FEATURES; Pg. 10

LENGTH: 524 words

iD: The Quest for Meaning in the 21st Century by Susan Greenfield Hodder, £8.99 £8.54

Baroness Greenfield says that she is not a Luddite but if that is true she does a tremendous job of impersonating one. In particular, iD: The Quest for Meaning in the 21st Century spends a fair few of its 293 pages arguing that modern technology - the internet, video games, interactive television - is threatening the human capacity for imaginative thinking and meaningful relationships. After pointing out that three-year-olds today lack the conversational skills of yesteryear's toddlers, the University of Oxford neuroscientist envisages a time "not so far off, when the whole idea of messy, face-to-face interaction, with its pheromones, body language, immediacy, and above all unpredictability, may have become an unpalatable alternative to a remote, online, sanitised and far more onanistic cyber-persona and life".

Lady Greenfield's concern is that the immediately gratifying, sensation-rich world of the screen alters the human brain so that it needs constant spoonfeeding with quick thrills. The screen, she fears, may replace the book as the primary tool for firing juvenile imaginations. It is true that experience moulds the brain and that television and computers are fixtures of the juvenile cultural landscape, but her thesis is highly speculative.

She notes that reading standards are not dropping; there is also scant robust evidence on the perils of

watching television (although an excess of it promotes obesity while slowing language development). Other facts, though, contradict her case: parents today believe that their children read more than they did, and sales of board games - surely the antithesis of the solitary, instant-thrill, shoot 'em up video world - rose last year.

Whether you agree with Lady Greenfield or not depends on your faith in human nature. For those, like me, who thrill at our capacity to embrace novel things, modern technology means the e-mails that reunite lost relatives, or the online dating service that turns a reclusive spinster into a bride. Besides, the human creativity that Lady Greenfield so wishes to preserve created all the technologies that she writes about - including the off button..

Also out now

The Morville Hours by Katherine Swift Bloomsbury, £8.99 £8.54 A lyrical journey through the seasons of Morville House and its garden, taking the form of a medieval book of hours.

One Minute to Midnight: Kennedy, Khrushchev and Castro on the Brink of Nuclear War by Michael Dobbs Arrow, £8.99 £8.54 Coverage of the mesmerising hour-byhour events of Black Sunday, a day that almost had a disastrously different end.

Quantum: Einstein, Bohr and the Great Debate about the Nature of Reality by **Manjit Kumar** Icon, £9.99 £9.49 Not so much an attempt to explain quantum physics but the illuminating story of quantum theory's evolution through portraits of its colliding pioneers - Niels Bohr and Albert Einstein.

The Penguin History of Modern China by Jonathan Fenby Penguin, £12.99 £11.69 Updated since the hardback, this is the exhaustive guide to China's transition from sick man of Asia to major global force.

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Cape Argus (South Africa)

April 06, 2009 Monday
e1 Edition

Understanding quantum physics and relativity

SECTION: LIFE; Pg. 13

LENGTH: 453 words

MARCUS Chown's book is a popular account for the general reader, and its subtitle A Guide to the Universe signals that it is not only about quantum mechanics but also the other great 20th century revelation - the theory of relativity.

The book by **Manjit Kumar**, on the other hand, is entirely about quantum mechanics and is intended for more serious but nevertheless also lay readers.

Chown writes for the respected New Scientist and says he has read other popular accounts and remained baffled, and believes he has done better.

He has a breezy style and a dubious sense of humour.

However, he does succeed to a remarkable degree in providing some understanding of general relativity using no mathematics and assuming no prior knowledge - no mean feat.

His quantum story is not well told, mainly because it covers too many phenomena too superficially, as a consequence of Chown's legitimate desire to impress upon us the truly extraordinary nature of the best account current physics gives of the world of the very small.

Kumar's book is a splendid lucid history of, and commentary on, the dramatic questions about the nature of reality arising from the last 100 years of work in quantum theory. The focus is the famous controversy between Einstein and Bohr, but there is a huge cast of other outstanding 20th century intellectuals. Their characters, friendships, rivalries and quarrels are all brought to life.

What exactly is the problem that has exercised these great scientists and any philosophers who have cared to interest themselves?

Well, a book review is short and Kumar takes more than 300 scholarly pages to give an answer. Very briefly, experiments have shown that a single electron, directed at a plate containing two fine closely spaced parallel slits, behaves as though when going through one slit it is aware of the presence of the other slit.

Bohr put forward what Heisenberg later called the Copenhagen Interpretation of quantum mechanics, to which he, Heisenberg, subscribed. The story is complex because the various supporters of versions of the Copenhagen Interpretation in fact held significantly different views.

However, roughly speaking, these physicists held that one could talk only about what was measured.

Kumar's learned book conveys the excitement of the long and ongoing struggle to understand the nature of reality, and the affront to common sense of what we now know of the nature of matter and light.

This, together with Chown's account of the nature of space and time may cause the interested reader to join the philosophical anti-realists who think that science gives us the truest way of looking at the world, without believing there is a world "out there" that is self defined. - Robert Segall

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Arts & Book Review

April 3, 2009
First Edition

PAPERBACKS;
Doing Without Delia By Michael Booth VINTAGE £7.99 (319pp) (free p&p) from the Independent Bookshop: 0870 079 8897

BYLINE: Reviewed by Christopher Hirst, Boyd Tonkin & Katy Guest

SECTION: BOOKS; Pg. 32

LENGTH: 1320 words

"Delia Smith was on fire." Slightly creepily, this culinary memoir begins with an auto-da-fe of cookbooks. Believing himself to be "a worthless fraud", food obsessive Michael Booth decides to learn real cookery at the Cordon Bleu school in Paris, even though it means transplanting his young family. Though there is plenty of the hopeless-amateur-cocks-it-up-in-the-kitchen stuff we're familiar with from Bill Buford's Heat and other volumes, Booth imparts a wealth of simple, worthwhile tips learned from his maitres. During preparation, for example, you can avoid repeated trips to the bin by putting a bowl for rubbish on the working surface.

Booth leavens his culinary learning with nice anecdotes, from the startling sight on a neighbour's balcony ("the gentleman stood behind his lady friend... and proceeded to mate") to an encounter with Gerard Depardieu, who displays irreproachable taste: "I love to eat in England. Even through all that mad cow thing I was still eating British beef."

Booth's distaste at crustacean murder - "I turned my lobster over: she was pregnant" (most chefs would say "berried') - suggests that he is too sensitive a soul for the professional kitchen and the last page announces "my retirement from the restaurant business". Though his prose sometimes tries too hard (a garbled instruction is compared to "Stanley Unwin reading Finnegans Wake in Mandarin"), this book is as richly enjoyable as a fine coq au vin (recipe on page 211). CH

Quantum

By Manjit Kumar

ICON £9.99 (448pp) (free p&p) from the Independent Bookshop: 0870 079 8897

By combining personalities and physics - both of an intriguingly quirky nature - Kumar transforms the sub-atomic debate between Einstein, Niels Bohr and others in their respective circles into an absorbing and (generally) comprehensible narrative. Though all of us can relish the revelation that Schrodinger's wave equation was inspired by a "late erotic outburst" with a lover in the Alps, only specialists will grasp Kumar's

explanation of electron distribution: "For n=2, either k=1 and m=0 or k=2 and m=-1.01." Though such opacities are rare, we can feel sympathy for Wolfgang Paul: "Physics at the moment is again very muddled... for me it is too complicated. I wish I were a film comedian." CH

For Liberty and Glory

By James R Gaines

NORTON £11.99 (533pp) (free p&p) from the Independent Bookshop: 0870 079 8897

No country likes to read about its defeats, so it's unsurprising that the Marquis de Lafayette is little known in Britain. This masterly account explores the close relationship between the cool George Washington and the ardent Frenchman. Lafayette was a "pushy French teenager" when he arrived in America in 1777, but won Washington's respect, even love. Eventually, he commanded an army at Yorktown, the battle of 1781 that lost us the colony. Gaines tells the action-packed story of these two ambitious aristocrats with panache, clarity and unexpected flashes of humour. CH

Galapagos: Through Writers' Eyes

By John Hickman

ELAND £12.99 (225pp) (free p&p) from the Independent Bookshop: 0870 079 8897

Unpopulated until the 18th century, the islands described by Melville as "five and twenty heaps of cinders" may not seem a very fruitful prospect for literary inspiration, but former ambassador Hickman proves the reverse is true. His stylish guided tour ranges from the Incas via Alexander Selkirk, the original Crusoe who had "much ado to bear up against Melancholy and Terror", to a creepy tale of real-life murder on Charles' Island in the Thirties, described as "worthy of Agatha Christie at the top of her form". Though war, piracy, colonial jostling and tourism all left their mark, Darwin's awed appreciation of the archipelago's unique natural assets is the most significant and readable chapter. CH

I Wish I'd Been There

Edited by Byron Hollinshed and Theodore K Rabb

PAN £8.99 (301pp) (free p&p) from the Independent Bookshop: 0870 079 8897

Purists may compare these "20 great moments in history by 20 great historians" to tableaux in Madame Tussaud's, but there is no denying their readability. Barbara A Hanway conveys the shock when Wat Tyler, doomed leader of the Peasant Revolt, took the hand of the intimidated 15-year-old Richard II and "shook it firmly". John Elliott notes how the Prince of Wales (later Charles I) was "overwhelmed by the grandeur and decorum of the Spanish court" during his fruitless wooing of the terrified Infanta. John Keegan reveals the strutting comedy of Montgomery as he received the surrender from Admiral von Friedeburg on Lüneburg Heath: "Who are these people? What do they want?" CH

Barbarism & Civilization

By Bernard Wasserstein

OXFORD £14.99 (901pp) (free p&p) from the Independent Bookshop: 0870 079 8897

This epic account of Europe in the 20th century grabs the reader with snappy chapters packed with telling detail and articulate assessments. Drawing on profound learning, Wasserstein's narrative adeptly changes focus from the national - "Germans in almost every sphere of society participated in some way in the mass murder" - to the individual. In a fascinating chapter on "Little Dictators", he notes that the Romanian Fascists known as the Iron Guard "attracted backing not only from gutter bully boys but also... young intellectuals, like Mircea Eliade, later a professor of religion at the University of Chicago." Possibly it is no coincidence that the

author is a history professor at the same institution. CH

Waltenberg

By Hedi Kaddour

VINTAGE £8.99 (660pp) (free p&p) from the Independent Bookshop: 0870 079 8897

If you can't yet face the relentless blood and thunder of Littell's The Kindly Ones, here's another French epic that drives headlong through the drama and horror of Europe in the past century - but does so on the chassis of a finely-engineered spy novel. Waltenberg spans 1914 to 1991, from the first bout of total war, grippingly conjured, to the delirious crack-up of the Soviet empire: Eric Hobsbawm's "short 20th century". Friendships - and betrayals - across the borders of geopolitics and ideology, especially among French, Germans and Americans, form the beating heart of a complex intrigue. Kaddour's shifting time-frames and viewpoints shed glittering light on high politics, low passions and the ruined vistas of history. Brilliant scene-setting and resonant ideas make this a thinking reader's espionage blockbuster that - in David Coward's luminous translation - stimulates and grips. BT

All in the Mind

By Alastair Campbell

ARROW £7.99 (297pp) (free p&p) from the Independent Bookshop: 0870 079 8897

The willing suspension of disbelief is more vital than usual for readers of this debut novel, since it purports to be an intense and sensitive psychological drama but is written by a man generally seen as a bully and a brute. Campbell's interior life must be more complex than he lets on, because his mixed-up psychotherapist character, Martin Sturrock, and his bizarre and wretched patients, are tenderly drawn and compelling. Perhaps the best thing that can be said about Campbell's elegant, thought-provoking prose is that it makes you forget that it is written by him. KG

The Private Patient

By PD James

FABER & FABER £12.99 (395pp) (free p&p) from the Independent Bookshop: 0870 079 8897

Never call her cosy. The ethics and economics of private practice for a busy NHS consultant; the conscience - and its limits - of a top-flight investigative reporter who fatally oversteps a line; the stable commitment of gay couples set against the psychic wreckage of trad marriages: all this, and a cracking mystery in a creepy Dorset mansion too. Murder aside, James does modern work so much better than her peers. True, her Adam Dalgliesh almost takes a back seat here, in spite of happy outcomes in his own private life. But a firmly-etched cast of team-mates and suspects, and the eerie Wessex landscapes steeped in the terrors of ancient myth, make this a case to savour. BT

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The Guardian (London) - Final Edition

March 28, 2009 Saturday

Saturday Review: Paperbacks: NICHOLAS LEZARD'S CHOICE: Quantum with solace: Quantum: Einstein, Bohr, and the Great Debate About the Nature of Reality, by Manjit Kumar (Icon, £9.99)

BYLINE: NICHOLAS LEZARD

SECTION: GUARDIAN REVIEW PAGES; Pg. 19

LENGTH: 665 words

In his book Einstein's Mistakes, Hans C Ohanian writes: "In December 1999, Time magazine named Einstein the man of the century. They would have done better to award this honor to Planck and to the other physicists who developed quantum mechanics. The 20th century was primarily the century of the quantum, and only secondarily the century of relativity." All our electronic gizmos rely on quantum physics; about the only thing relativity is useful for is GPS - yet that itself relies on quantum-based electronics.

So this is important; and yet it is also hard. It is also, at times, extraordinarily counter-intuitive; as one of its pioneers, Niels Bohr, once famously said, "those who are not shocked when they come across quantum theory cannot possibly have understood it".

Take the famous double-slit experiment, which shows that light can obligingly behave either as a wave or a particle, depending on how you want it to behave; or that information about the spin of an electron can be gathered, in theory at least, even if it is at the other end of the universe, thus making a nonsense of Einstein's edict that nothing can go faster than the speed of light. Einstein himself spent much more time brooding about quantum theory than he did about relativity, and his arguments with other physicists about, for example, the Copenhagen Interpretation, kept everyone up to speed - even at the cost of Einstein's own reputation.

This book revivifies such arguments. Einstein proposed to Bohr a light-filled box with a clock in it which, at a predetermined time, would release a single photon; the box was on a sensitive spring which would record its weight before and after the emission of the photon. Take it from me, this is, on the face of it, a massive hole beneath the waterline for quantum theory. Neils Bohr was described as looking, that evening, "like a dog who has received a thrashing". But after a sleepless night wrestling with the problem, Bohr came up with a counter-refutation - and one which, ironically, used relativity. (See if you can work it out yourself!).

Now, there are many science books out there today which take you gently by the hand and make noises like

the ones used to soothe startled horses, so as not to panic the general reader. This is not, I had better warn you, one of them. It contains sentences such as: "Where there had previously been a single energy state with a unique set of three quantum numbers n, k, and m, there were now two energy states n, k, m, A and n, k, m, B." I had to read Quantum in three days flat, and after writing this review I am going to go on a rest cure in a Swiss sanatorium for a few months and do nothing but learn how to paint watercolours.

But the reason this book is, in fact, readable is because it contains vivid portraits of the scientists involved, and their contexts. Your knowledge of the cultural life of the first half of the 20th century is incomplete without a picture of this scene. And dull it isn't. You can skip much of the science if you wish - you're not going to be taking an exam in the subject, after all - and revel in the portraits of Einstein (his breathtaking list of demands to his wife, for example: "3. You must leave my bedroom or office immediately without protest if I so request"), or of Schrodinger, the charming womaniser, who set up house with both his wife and his mistress, or the Belfast physicist John Stewart Bell, a real working-class hero, who appears to have resolved one of the chief paradoxes of quantum theory ("the case of Bertlmann's socks is often cited").

This is about gob-smacking science at the far end of reason; as Rutherford said after one experiment involving alpha particles, "it was almost as incredible as if you had fired a 15-inch shell at a piece of tissue paper and it had come back and hit you" - and with extraordinary implications for the nature of reality. Take it nice and slowly and savour the experience of your mind being blown without recourse to hallucinogens.

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The Daily Telegraph

The Daily Telegraph (London)

December 13, 2008 Saturday

Quantum: Einstein, Bohr and the Great Debate About the Nature of Reality;
by Manjit Kumar;
448pp, Icon Books, pounds 20;
T pounds 18 (plus pounds 1.25 p&p) 0844 871 1515;
The solace of quantum

BYLINE: Andrew Crumey

SECTION: BOOKS; Pg. 23

LENGTH: 738 words

Even popular science is not safe from Bond mania. **Manjit Kumar** describes how Einstein, appointed to Prague University in 1911, found the pay cheque "a quantum of solace against the creeping sense of isolation". His book may not be high on thrills but it is certainly an adventure, as he traces the history of quantum theory.

Kumar has taken on a formidable task: modern physics is famously incomprehensible, even to people who work on it. As Richard Feynman supposedly said, "If you think you understand quantum mechanics, you probably don't." But did he ever really say that? That's another problem for Kumar: weighing up the evidence. It would be a rare author who could fully address both the philosophical and the historical issues - an even rarer one who could make it all palatable and entertaining to a general audience. If Kumar scores less than full marks it is only because of the admirably ambitious scale of his book.

His chapters take us through the work of Planck, Bohr, Einstein and others, mixing biographical facts with an outline of their ideas. The section on Heisenberg illustrates both the strength and weakness of the approach. Trying to make sense of the energy levels of atoms - and suffering atrociously from hay fever - the young Heisenberg went to the North Sea island of Heligoland and had his eureka moment. Measuring first the position and then the momentum of an electron, he realised, would yield a different answer from doing the measurements the other way round. Thus was born his uncertainty principle, which Heisenberg interpreted as saying that any observation changes what is being observed.

Kumar accurately and succinctly retells this famous story, but a historian would question the sources, and a philosopher would question the meaning. The source in this case is Heisenberg, writing many years later, after he had led the German atom bomb project. No one would take at face value Heisenberg's claims that he was a reluctant Nazi who wanted the bomb to fail; we should surely be equally cautious about his recollection of conversations with Einstein that supposedly led him to his great discovery. Yet these are reported as fact.Niels Bohr, as Kumar points out, quickly objected to Heisenberg's interpretation of the principle; but Kumar's explanation is clumsy. "What prohibits the precise measurement of the momentum of the electron is not the discontinuous and uncontrollable nature of the momentum change, Bohr argued, but the impossibility of measuring that change exactly." Bohr was notoriously obscure but never quite so circular. Kumar eventually arrives at Bohr's real point. Saying that measurement alters what is being measured implies a previous "real" value we can never know; yet for Bohr, as Kumar says, "an unobserved electron does not exist".

This led to a debate between Bohr and Einstein about the meaning of reality itself, in which Heisenberg (and nearly everyone else) sided with Bohr. That great debate forms the heart of Kumar's book, and is its most enjoyable part. Kumar trained as a physicist, and his explanation of the ingenious "thought experiments" with which the two giants tried to outwit each other is clear and precise. It is perhaps a pity that the whole book was not geared around this episode (as the subtitle implies), since it brings into focus the theory's puzzling core.

Most general readers, I suspect, will be more interested in such basic questions than in black-body radiation or electron spin, which get almost equal coverage. Some may also be disappointed that although the narrative takes us up to recent experimental vindications of Bohr's "Copenhagen interpretation", there is very little on Everett's "many worlds" alternative, and nothing at all on quantum field theory, whose predictions are to be tested by the Large Hadron Collider.

Still, although I would not recommend this book to anyone hoping to learn quantum theory without tears, for those who already know at least some of the physics and want a brief, non-academic but thorough history of the subject's golden age, it is hard to beat, even if nits can be picked. Most interesting to me is the light Kumar sheds on minor figures whose names are rarely mentioned in lecture courses, though they made crucial contributions that were taken up by the bigger stars. In physics, as in everything else, history gets

written by the winners. Kumar gives some runners-up their due.

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Arts & Book Review

December 5, 2008
First Edition

Collisions with the solace of quantum; Quantum By Manjit Kumar ICON £20 (448pp) £18 (free p&p) from 0870 079 8897

BYLINE: ANDY MARTIN

SECTION: BOOKS; Pg. 34

LENGTH: 610 words

Dr Johnson furiously rejected Bishop Berkeley's contention that the world was nothing but a collection of our ideas and impressions and that therefore when you walked out of a room (assuming there was no one else in it) it ceased to exist. "I refute it thus!" Johnson proclaimed, kicking at a stone. Though he started out as a relativist, Albert Einstein was driven into becoming the Dr Johnson of the 20th century, forever kicking out at the most fantastical formulations of quantum theory.

Manjit Kumar's Quantum is a super-collider of a book, shaking together an exotic cocktail of free-thinking physicists, tracing their chaotic interactions and seeing what God-particles and black holes fly up out of the maelstrom. He provides probably the most lucid and detailed intellectual history ever written of a body of theory that makes other scientific revolutions look limp-wristed by comparison. Sex, suicide and genocide get a look-in too, but in the end the fate of the world seems to hang on the random trajectories of invisible specks of matter.

Ironically, Einstein gave a kick-start to the theory he ultimately sought to overthrow. One of his early papers talks of "light-quanta" (later "photons"), not so much a "ray" as a stream of bullets. Nobody took him seriously. Then Niels Bohr, the Danish physicist, pulled together Planck, de Broglie, Heisenberg and Schrödinger and gave coherence to theories of incoherence and discontinuity. Bohr imposed a vision of the micro-universe as an asylum of high-speed schizoid anarchists and lottery-playing paradoxes.

Light is both wave and particle simultaneously. The Uncertainty Principle prohibits you from knowing everything you want to know. On the other hand, you can have a cat in a box which is both alive and dead.

Knowing the mind of God was implicit in classic Newtonian science. After the "Copenhagen interpretation", it wasn't clear if God really knew what he was doing in the first place. Which is why Einstein objected, "God does not play dice". All over Europe and America, Einstein and Bohr locked horns, with Einstein dreaming up experiments that would pin down these pesky particles and Bohr letting them out of the box all over again.

Their argument hinged on whether the universe was or was not "observer-independent". Bohr argued that if every observation subtly altered the very thing you were looking at then all we can ever have is a bundle of theories and measurements. "Do you think the moon ceases to exist just because you have stopped looking at it?" was Einstein's withering retort.

Entangled particles are the telepathic identical twins of the quantum realm. Even though separated by interstellar spaces, they still resonate instantaneously to each other's vibe. Einstein derided "spooky action at a distance", but this absurdity has now been experimentally demonstrated. God has been caught playing dice.

The truth is out there. Yet the very notion of "out" and "there" reveals the subtle human-centred, "anthropic" perspective that pervades our most empirical observations. It is as if the two antagonists in this great debate, Einstein and Bohr, are as entangled as the strands of a double helix.

Although Kumar (I think) throws in his lot with the quantum side of the equation, he remains classical and clinical in methodology and style. He keeps the "I" hygienically removed from all the argument, as if everything really was being observed by a neutral god. But as Bertrand Russell once pointed out, if you want to be strictly objective, you can't say, "There is a dog". You ought to say, "I see a canoid patch of colour."

Andy Martin's latest book is 'Stealing the Wave' (Bloomsbury)

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The Guardian (London) - Final Edition

November 15, 2008 Saturday

Saturday Review: The mischievous oracle: A brilliant guide to quantum physics impresses Steven Poole: Quantum: Einstein, Bohr, and the Great Debate About the Nature of Reality by Manjit Kumar 448pp, Icon, £20

BYLINE: Steven Poole

SECTION: GUARDIAN REVIEW PAGES; Pg. 7

LENGTH: 1028 words

Quantum physics is the branch of science most irresistible to raiders from other disciplines who don't quite understand it. The catalogue of literary-metaphorical abuses of Heisenberg's uncertainty principle, for example, must run to thousands of entries. This ought not to be surprising +Ai for, as this new book shows, the discipline has from its inception been intimately bound up not just with empirical investigation, but with passionate philosophical arguments

about the nature of existence itself. One might not have the mathematics to follow every step of the science, but

everyone has a potential stake in what it seems to imply about reality and our relationship with it.

Manjit Kumar's book is an exhaustive and brilliant account of decades of emotionally charged discovery and argument, friendship and rivalry spanning two world wars. In what also has to operate as a kind of group biography of Planck, Einstein, Bohr, Heisenberg, Pauli, Dirac et al, the quasi-novelistic character sketches occasionally have a

comic quality ("The son of a tax collector, Ludwig Boltzmann was short and stout with an impressive late 19th-century beard"); but the real meat of the book is the explanations of science and philosophical interpretation, which

are pitched with an ideal clarity for the general reader. Perhaps most interestingly, although the author is admirably

even-handed, it is difficult not to think of Quantum, by the end, as a resounding rehabilitation of Albert Einstein.

You might have thought that Einstein, the most famous scientist who ever lived, was not much in need of

rehabilitation. But for a long time, the standard story of his reaction to quantum theory painted him as a grouchy

old man, whose great work was long in the past, and who could no longer accept novel ideas. The truth, as Kumar

shows, is very different.

For a start, Einstein was himself a pioneer of quantum theory, having suggested in 1913 that light was quantised +Ai in other words, that it was not smoothly continuous, but could only exist in multiples of very small packets, or quanta. At the time, Kumar relates, this was "just too radical for physicists to accept". Two decades

later, the great Danish physicist Niels Bohr and his colleagues, who had taken this idea and run with it, had be-

come too radical for Einstein to accept.

But Einstein did not merely snipe ineffectually from the sidelines at those who were doing important science. He

was taken very seriously at the time, as Kumar's thrilling narrative of a series of epic thought-experiment battles

between Einstein and Bohr shows. The popular misconception of his role was in part Einstein's own fault, as he

liked to repeat his slogan "God does not play dice" at every opportunity +Ai yet, as Kumar demonstrates, his real

objection was not to the probabilistic or statistical interpretation of quantum mechanics, but to its radical denial of an independent reality.

Bohr+Aos "Copenhagen interpretation", which became orthodoxy for most of the century, still has the power to shock. What it states, baldly, is that reality is determined by the experiment the scientist chooses to perform. One

kind of experiment will cause light to behave like a particle; another kind will make it act as a wave. There is no underlying truth about what light "really" is. And an electron doesn't have a definite position in space before you choose to measure it: in measuring it, you somehow oblige it to make up its mind as to where it is. (Heisenberg's uncertainty or "indeterminacy" principle, by the way, says that if you come to know an electron's position in this way, its momentum cannot also be accurately known; and, crucially, that this is not just a function of our experimental limitations, but also of the truth about

electrons. If an electron has a definite position, it simply does not have a defi nite momentum, and vice-versa.)

So reality is a kind of mischievous oracle, answering only when directly questioned. Erwin Schr1/3*dinger's famous imaginary cat (inspired in part by an exchange of letters with Einstein) was intended as a reductioad absurdum of this conception. The cat in question is locked in a box,

together with a crumb of radioactive material, which may or may not decay in the course of an hour. If the crumb

decays, it will set off a mechanism that poisons the cat. After an hour, what can you say about how the cat is doing

without opening the box? Intuitively, it's obvious: either the cat is alive, or it isn't. But, said Schr1/3*dinger, a quantum theorist would be obliged to say that the box contained "the living and the dead cat (. . .) mixed or smeared out in equal parts". According to Copenhagen, there is no truth about the cat's alive-or-deadness until someone opens the box and observes it.

Perhaps the most embarrassing question asked of the Copenhagen interpretation was a version of the

cat paradox scaled up to cosmic size. Copenhagen says that nothing is definitively so until an act of observation

"collapses the wave-function" of the system in question (condensing, so to speak, a cloud of probability into one

thing or another). If that is true, how did the universe itself begin? What monstrous (or maybe divine) act of

observation could have collapsed the wave-function of the entire universe so as to promote it to physical reality?

Some physicists subsequently adopted a "many worlds interpretation", which envisioned an endlessly branching

multiplicity of universes. It may have shut down the original observation question, but only at the price of an

uncomfortable ontological profligacy. Kumar's story finishes by noting the results of a 1999 poll of physicists at

a Cambridge conference as to which interpretation of quantum mechanics they preferred. Of 90 respondents, "only four voted for the Copenhagen interpretation, but 30 favoured the

modern version of (. . .) many worlds. Significantly, 50 ticked the box labelled 'none of the above or undecided'".

The question of the ultimate nature of reality is, it seems, still a live problem. Somewhere, Einstein is puffing on his

pipe and smiling ironically.

To order Quantum for 3/4£18 with free UK p&p call Guardian book service on 0870 836 0875.

LOAD-DATE: November 15, 2008

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newspaper

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Scotland on Sunday

October 12, 2008, Sunday
Review Edition

Also published this week...

SECTION: Pg. 12

LENGTH: 270 words

Non-fiction

Hell-Fire Clubs

Evelyn Lord, Yale UP, GBP 19.99

Sometimes seen as the dark underbelly of the Enlightenment, this volume strips away the myths from such societies as the Beggar's Benison, the Mowhawks and the Medmenham Friars - radicalist seed beds or seedy cliques of Satanists?

Quantum

Manjit Kumar, Icon, GBP 20

An elegantly written and accessible guide to quantum physics, in which Kumar structures the narrative history around the clash between Einstein and Bohr, and the anxiety that quantum theory "disproved the existence of reality".

Fiction

Folly

Alan Titchmarsh, Hodder & Stoughton, GBP 18.99

A multi-generational saga from the prolific celebrity gardener with the grab-line "Their love story began before they were born..." The opening chapter quotes Hardy, but comparisons, as they say, are odious.

A Time To Every Purpose Under Heaven

Karl O Knausgaard, Portobello, GBP 18.99

Billed as the most exciting Scandinavian fiction since Miss Smilla, this eclectic,hefty novel features a Renaissance boy who might have encountered an angel, and devotes his life to determining if the divine can change.

Travel

The Island That Dared

Dervla Murphy, Eland, GBP 16.99

"Travel legend" Murphy has long been obsessed with post-revolutionary Cuba and this travelogue recounts her ongoing love affair with the island, mixing reportage with commentary

Passport To Enclavia

Vitali Vitaliev, Reportage Press, GBP 12.99

A paean to local identities, Ukrainian-born Russian exile Vitaliev journeys to the fragments of countries lingering behind other borders, and makes a compelling case against the centralism of what he dubs the EU-SSR

LOAD-DATE: October 13, 2008

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newspaper

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The Irish Times

October 9, 2008 Thursday

Exploring the mysteries of the world at a microphysical level

SECTION: OPINION; Opinion; Pg. 15

LENGTH: 660 words

BOOK OF THE DAY - Colm Keena: Quantum: Einstein, Bohr and the great debate about the nature of reality.Manjit Kumar Icon books; 360pp; £20

IN THE early years of the 20th century, young male physicists in England, Germany, France, Denmark, Austria and Switzerland were part of a great collective effort that has transformed the planet on which we live by opening the way for much of what defines the modern world.

Manjit Kumar documents how these scientists strove to identify or describe how the world operates at the atomic or microphysical level. Through their work, they developed the theories that led to the electron microscope, the laser, the computer and the atomic bomb, even though at the heart of it all there was a conundrum that has not yet been resolved.

Early in the 20th century, Albert Einstein floated the idea that light might emerge from atoms not as a continuous wave, but as discreet bits, or quanta. He suggested this because he was troubled by a seeming dichotomy: if matter is energy and made of atoms, and atoms are made of discrete, discontinuous particles, then how can light, a form of energy, flow like a wave from an atom?

During the 1920s and 1930s, the debate over the nature of light and microphysical items such as electrons became increasingly acute. Were they particles, quanta, or were they waves, like the waves that ripple out from the stone dropped in a pond? A gallery of scientific greats was involved: Niels Bohr; Louis de Broglie; Wolfgang Pauli; Max Born; Werner Heisenberg; Paul Dirac; and others.

Later in the century, a scientist born in working-class Belfast in 1928, John Stewart Bell, achieved progress in a way that eluded Einstein and Bohr.

Kumar brings us through the detail of the various advances, confusions and mistakes, and what emerges clearly is a picture of how science works as a great international collective effort. Insights, difficulties and findings are shared through publication, informal correspondence and collaborative effort.

The foundations for the technologies that have made the modern world are documented in this book, but not one of the scientists involved took out a patent.

At the core of the book is quantum mechanics, a theory that implies there is a limit to what can be known

about the microphysical level. If you test for the location of an electron, you cannot test for its momentum. If you test for its momentum, you cannot test for its location. The champion of the theory, Niels Bohr, argued that, at the microphysical level, science is not describing a world that exists independently of the experiments that seek to say something about it. "There is no quantum world," he said. "There is only an abstract quantum mechanical description."

Einstein recoiled at this idea. He refused to accept that quantum mechanics was a complete or finished theory, beyond which science would never travel so as to tell us something about an independently existing reality. As we leave the book, all we are told is that Einstein may, after all, have been correct.

The book is a tough read at times, but then there are the pen pictures of the scientists involved and, not least, the political backdrop to their work. In October 1929, the Wall Street Crash occurred. The economic collapse was felt particularly badly in Germany, where discontent soon swept the Nazis into power. In 1933, the Nazis sacked Jews working in their universities, and overnight the universities lost almost half of their theoretical physicists.

Einstein, who had been living in Berlin, spent the rest of his days in the US. As the Jewish intelligentsia fled Hitler, there was a sudden haemorrhaging of German and European intellectual capital, with most of it ending up in the US. A huge transfer of power occurred, much in the way that financial and political power is now slipping, as this review is being written, from the US.

Colm Keena is an *Irish Times*journalist and a science graduate of Trinity College Dublin

LOAD-DATE: October 9, 2008

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newspaper

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Birmingham Evening Mail

August 22, 2008 Friday
First Edition

Unlicensed limo firm boss fined

SECTION: NEWS; Pg. 22

LENGTH: 156 words

THE boss of an unlicensed stretch limousine firm has been fined by magistrates.

Manjit Kumar was caught out in an operation mounted by Walsall licensing enforcement officers who posed

as customers wanting to travel to Birmingham International Airport with his firm, MK Luxury Limousines.

When the vehicle arrived on December 13 last year, licensing and police officers were waiting to pounce.

Kumar, 34, of St John's Road, Darlaston, was fined pounds 750 by Walsall magistrates with pounds 180 costs and a pounds 15 victim surcharge.

He admitted operating an unlicensed stretch limousine business, using an unlicensed vehicle and permitting the vehicle to be used by an unlicensed driver.

Walsall Council's executive director for neighbourhoods, Jamie Morris, welcomed the court's punishment.

"This is an excellent court judgement which we warmly welcome," he said.

"It sends out a clear message that we will take firm action."

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LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newspaper

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Hindustan Times

January 30, 2007 Tuesday 1:51 AM EST

MOVE TO POPULARISE GEO-PARK CONCEPT

BYLINE: Report from the Assam Tribune brought to you by the Hindustan Times

LENGTH: 625 words

DATELINE: GUWAHATI

GUWAHATI, Jan 30 -- The State has a number of places, which can be developed into geo-parks. While the Majuli River Island has all the potential to be developed into a riverine geo-park, the Digboi-Margherita area has the prospect of being developed into an energy heritage geo-park.

This is the observation of **Manjit Kumar** Mazumdar and Dr Arun Kumar Borah, who attended the 2nd UNESCO International Conference on Geo-parks at Belfast, Northern Ireland, recently. While Dr Borah is the Head of the Department of Geology, Cotton College, Mazumdar teaches geology at the city's Pragjyotish College. They presented two papers on energy geo-park in Asom and landscape diversity in promotion of geo-conservation and geo-tourism in Majuli River Island.

However, both of them maintain that the geo-park concept is yet to be recognized by the Union Government and legislation for the purpose is also needed before going for setting up geo-parks in any part of the country.

The entire process also needs a central co-ordination committee after the notification of the legislation is done. Only then the States will be able to project their potential geo-park sites and go for the measures to develop them. It is mandatory that the countries should have their own national geo-park network before seeking the Global Geo-park Network (GGN) affiliation, they say.

The geo-park concept originated in Europe in 2000. And now, with the growing consciousness among the people all over the world for conservation of the natural, particularly geo-resources, it is a rapidly growing concept. However, the concept of geo-parks is not confined to conservation of landscapes and rocks alone, it emphasizes the need to pay attention to people also.

Considering its limitless educational and economic significance, the geo-park concept was recognized by the UNESCO in 2004 and that led to the birth of the GGN. At present, 50 geo-parks from all over the world are the members of the GGN, while several others are being inducted to this network, said Mazumdar and Borah.

In Asia, China is the leader in the geo-park movement with 138 national level geo-parks. Of these Chinese geo-parks, 18 are affiliated to the GGN. Countries like Malaysia, Japan, Russia, Kazakhstan, Australia, South Africa, Morocco, Turkey, Brazil and many others are also taking initiatives to set up their own national geo-parks.

Mazumdar and Dr Borah had the opportunity to interact with Margarete Patzak, Assistant Programme Specialist, Earth Observation Section, Division of Ecological and Earth Sciences, UNESCO and Mr Robert Missotten, Secretary, International Geo-science Programme, Division of Ecological and Earth Sciences, UNESCO during the Belfast conference. Mr Missotten enquired about the political support to the Majuli World Heritage Site recognition effort.

Mr Missotten announced in the conference that the UNESCO was planning to initiate an awareness programme for the politicians on the geo-park concept. Henceforth, he said, preference would be given to geo-park proposals coming from the developing countries, while granting affiliation-cum-membership of the GGN to them.

Mazumdar and Borah suggest that there should be an all out move to motivate all the stakeholder Ministries at the Centre, like the Ministry of Science and Technology, the Ministry of Earth Sciences, the Ministry of Tourism and Culture etc for chalking out proper guidelines and a road map for setting up an Indian Geo-Park Network.

The country needs to be much more innovative and aggressive to catch up with the concept which has already stirred the imagination of many nations during its six years of existence, they say.

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Birmingham Evening Mail

December 22, 2005, Thursday
South City Edition

South City News: Birmingham Magistrates

SECTION: NEWS; Pg. 22

LENGTH: 720 words

Cases dealt with by Birmingham Magistrates' Court on Friday, December 16: MARK Julian Coley, 36, of School Acre Road, Shard End, used threatening, abusive or insulting words towards victim Wendy Kelleher, given a 12-month community order, fined pounds 100 and ordered to pay pounds 50 costs and pounds 100 compensation; Cliff Thomas, 43, of Elstone Court, Spring Hill, breach of the peace, bound over in the sum of pounds 100 and ordered to keep the peace for six months, particularly towards Lorraine Hamilton

John James Coleman, 32, of Vauxhall Road, Nechells, used threatening, abusive or insulting words or behaviour and fined 350; Israr Ullah, 21, of Highfield Road, Washwood Heath, had a metal hammer wrapped in a rubber glove intended to be used for a theft, committed to prison for 56 days; **Manjit Kumar** Jakhu, 29, of Farcroft Road in Handsworth, assaulted by beating victim Dean Lyons, fined pounds 300, costs pounds 250 and ordered to pay victim pounds 50 compensation; Robert Fogoe, 50, of Rough Road in Kingstanding, assaulted Cynthia Yvonne Fogoe thereby occasioning her actual bodily harm, sentences to a 24-month community order, 100 hours unpaid work and ordered to pay pounds 150 compensation; Amjid Hussain, 28, of Brewery Street in Handsworth, breach of the peace, bound over in the sum of pounds 250 to keep the peace for 18 months; Sean Michael Kelleher, 37, of Fordfield Road in Kitts Green, assaulted by beating Karen Kelleher, given four-month suspended prison sentence, ordered to carry out 150 hours unpaid work and pay costs of pounds 70 and compensation of pounds 250. For resisting a police officer, Kelleher was given a 12 month conditional discharge

Michael Hughes, 20, of Stirling Road in Edgbaston, assaulted John Sandoz thereby occasioning him actual bodily harm, was given a 24-month community order, 150 hours unpaid work, costs of pounds 50 and compensation of pounds 50; Craig O'Neill, 34, of Henshaw Road in Small Heath, drove a car not in accordance with his licence, fined pounds 200, ordered to pay pounds 35 costs and given four penalty points; Mohammed Arsib, 25, of Londonderry Lane in Warley, dishonestly received a stolen cheque book, was given a 12-month supervision order and ordered to pay Barclays Bank pounds 1,300 compensation, and for three counts of using a stolen cheque he was given a 12-month supervision orders, all to run concurrently with the first; Robert Kennedy, 42, of The Parade in Birmingham city Centre, charged with breaching the peace and bound over in the sum of pounds 100 to keep the peace for six months; Ian Cowshill, 25, of Rowan Way in Northfield, drove a car while over the legal alcohol limit, fined pounds 250, ordered to pay pounds 85 costs and banned from driving for 18 months; Jodhbir Gill, 25, of Kingsbury Road in Lea Marston, charged with drink driving and sentenced to pay pounds 85 costs, fined pounds 250 and banned from driving for 12 months; Sukhdev Singh Saund, 56, of Hamstead Hill in Handsworth Wood, for soliciting a woman for

the purpose of prostitution he was fined pounds 50, ordered to pay pounds 85 court costs and disqualified from driving for three months, Peter Debnery, 57, of Kemberton Road in Weoley Castle, charged with driving without insurance and fined pounds 100, ordered to pay pounds 42 court costs; Gemma Francis, aged 18, of Gravel Bank in Birmingham, charged with assault by beating Lee Richardson, given a 12-month community order, including 40 hours of unpaid work, and ordered to pay pounds 30 court costs as well as pounds 100 in compensation to her

victim; Nathan Francis, of Gravel Bank in Woodgate Valley, aged 20, charged with assault by beating Lee Richardson, was given a 12-month community order, ordered to pay court costs of pounds 30 and compensation to the victim of pounds 100; Christopher Pearson, 29, of Apsley Grove in Dorridge, Solihull, charged with drink driving and given a 12-month community order, disqualified from driving for 12 months and ordered to ay pounds 70 court costs. For wilfully obstructing a police constable, Pearson was given a further 12-month community

order; Jamie Wilson, 27, of Crychan Close in Frankley, charge with driving while disqualified, given a 12 month community order, had his licence endorsed with six penalty points and ordered to pay costs of pounds 70

LOAD-DATE: December 23, 2005

LANGUAGE: ENGLISH

PUBLICATION-TYPE: Newspaper

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Guardian Weekly

November 26, 2003

Blood, sweat and imagination; Seven Wonders of the Industrial World by Deborah Cadbury; Fourth Estate 376pp £ 20 (£ 17)

BYLINE: Reviewed by **Manjit Kumar**

SECTION: BOOKS; Pg. 17

LENGTH: 686 words

The Great Pyramid of Giza, the Hanging Gardens of Babylon, the Statue of Zeus at Olympia, the Temple of Artemis at Ephesus, the Mausoleum at Halicarnassus, the Colossus of Rhodes and the Pharos of Alexandria. These were the seven wonders of the ancient world as drawn up in the Middle Ages.

Only the Great Pyramid, built c 2560BC, has survived. It is unlikely that any of Deborah Cadbury's seven wonders of the industrial world will survive as long. Her magnificent seven are: the Great Eastern, the Bell Rock Lighthouse, Brooklyn Bridge, the London sewers, the Transcontinental Railroad, the Panama Canal and the Hoover Dam.

In fact Isambard Kingdom Brunel's SS Great Eastern was sold for scrap within 30 years of being launched in 1859. On her maiden voyage to New York, the Great Eastern had on board 38 passengers and a crew of 418. It was designed to carry 4,000 passengers in luxury all the way to Australia, but a catalogue of disasters and the opening of the Suez Canal turned the Great Eastern into a giant white elephant.

While Brunel was busy building his "great ship" on the Isle of Dogs, London was drowning in excrement as the city's 200,000 cesspits overflowed. By 1854 three outbreaks of cholera had left 30,000 dead. Something had to be done, but only after the "great stink" had forced MPs to flee the capital in fear of their lives. Joseph Bazalgette, chief engineer of the Metropolitan Board of Works, proposed an ambitious scheme to build an underground network that linked London's 1,600km of street-level sewers.

The London sewers may seem like an odd choice, but Cadbury's selection reflects her desire to tell the story of how the modern world was forged "in blood, sweat and human imagination". There was plenty of all three.

With the exception of the Hoover Dam -- constructed at the height of the Depression, when poverty-stricken workers died building it ahead of schedule and under budget for a few dollars a day -- Cadbury's wonders are products of the industrial revolution, when a worker's life was even cheaper.

None cost more in lives than the Panama Canal, begun by the French in 1880. Within 10 years the jungle, swamps and tropical diseases had left more than 20,000 dead. But what really mattered to investors was the $ 280m lost by the time the canal company was declared bankrupt. It was the largest financial collapse of the 19th century and led to the downfall of the French government. Work only restarted in 1901, when Theodore Roosevelt realised that a canal was vital for US naval supremacy. It would take 12 years, and another 5,000 lives, before the "longest 50 miles in history" was complete.

Cadbury's earliest and smallest wonder was built during the Napoleonic wars. In 1807 Robert Stevenson started work on the Bell Rock Lighthouse off the east coast of Scotland. The Bell Rock, a treacherous reef 17.5km out to sea, "breathed abroad an atmosphere of terror". The main problem Stevenson faced was the fact that the Bell Rock lies more than 3m beneath the sea for all but three hours of each day. It took four years, more than 2,500 tonnes of stone, and a brave team of men, who received 20 shillings a week, to conquer "the terrible power of the Bell Rock".

Whereas Stevenson and his men toiled above the water, Washington Roebling faced a mysterious disease, which his men nicknamed "the bends", as they laboured beneath the East River that divides New York and Brooklyn to build what would be the world's longest suspension bridge.

Only three years into the project Roebling suffered a terrible case of the bends. Lucky to survive, he was too weak to leave his house and had to dictate his instructions to his wife. When the bridge opened in 1883, Roebling could only watch from his bedroom window.

While "practical visionaries" such as Brunel, Stevenson and Roebling may have been "taking risks and taking society with them as they cut a path to the future", Cadbury does not forget those who risked their lives just to survive. What makes this book a compelling read is the heroism and desperation of ordinary men.

LOAD-DATE: December 2, 2003

LANGUAGE: ENGLISH

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The Guardian - Final Edition

November 8, 2003

Blood, sweat and imagination: Manjit Kumar salutes the visionary creators of the seven wonders of the modern age: Seven Wonders of the Industrial World by Deborah Cadbury 376pp, Fourth Estate, $:20

BYLINE: Manjit Kumar

SECTION: Guardian Saturday Pages, Pg. 11

LENGTH: 853 words

The Great Pyramid of Giza, the Hanging Gardens of Babylon, the Statue of Zeus at Olympia, the Temple of Artemis at Ephesus, the Mausoleum at Halicarnassus, the Colossus of Rhodes and the Pharos of Alexandria. These were the seven wonders of the ancient world. The list was drawn up in the Middle Ages with probably as much rancour surrounding it as any team selection by Sven-Goran Eriksson.

Only the Great Pyramid, built around 2560BC, has survived. It is unlikely that any of Deborah Cadbury's seven wonders of the industrial world will survive as long. Her magnificent seven are: the Great Eastern, the Bell Rock Lighthouse, Brooklyn Bridge, the London sewers, the Transcontinental Railroad, the Panama Canal and the Hoover Dam.

In fact, Isambard Kingdom Brunel's SS Great Eastern was sold for scrap within 30 years of being launched in 1859. Dubbed the "Crystal Palace of the Seas", it was almost 700ft long, made of iron and held together by three million rivets. On her maiden voyage to New York, the Great Eastern had on board only 38 passengers and a crew of 418. It was designed to carry 4,000 passengers in luxury all the way to Australia, but a catalogue of disasters and the opening of the Suez Canal turned the Great Eastern into a giant white elephant.

While Brunel was busy building his "great ship" on the Isle of Dogs, London was drowning in a sea of excrement as the city's 200,000 cesspits overflowed. By 1854, three outbreaks of cholera had left 30,000 dead. Something had to be done, but only after the "great stink" had forced MPs to flee both parliament and the city in fear of their lives. Joseph Bazalgette, chief engineer of the Metropolitan Board of Works, proposed an ambitious scheme to build an underground network that linked London's 1,000 miles of street-level sewers. The sewage system took 12 years to complete, and as London breathed easier, it was hailed by the Observer, in 1861, as "the most extensive and wonderful work of modern times".

The London sewers may seem like an odd choice, but Cadbury's selection reflects her desire to tell the story of how the modern world was forged "in blood, sweat, and human imagination". There was plenty of all three.

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Cadbury's earliest and smallest wonder was built during the Napoleonic wars. In 1807, Robert Stevenson started work on the Bell Rock Lighthouse off the east coast of Scotland. The Bell Rock, a large reef 11 miles out to sea, had claimed countless lives as it "breathed abroad an atmosphere of terror". The main problem Stevenson faced was the fact that the Bell Rock lies 16ft beneath the sea for all but three hours of each day. It took four years, more than 2,500 tonnes of stone, and a brave team of men, who received 20 shillings a week, to banish "the blackness enveloping the terrible power of the Bell Rock".

Whereas Stevenson and his men toiled above the water, Washington Roebling faced a mysterious new disease, which his men nicknamed "the bends", as they laboured beneath the East River that divides New York and Brooklyn. Roebling's father, John, had designed the Brooklyn Bridge to connect America's two fastest-growing cities, but died in an accident before work began. It was left to his son to oversee the construction of what would be the longest suspension bridge in the world.

Only three years into the project, Roebling suffered a terrible case of the bends. Lucky to survive, he was too weak to leave his house and had to continue working on the bridge by dictating his instructions to his wife. When the bridge opened in 1883, after 14 years of labour, with the loss of 20 men, Roebling could only watch from his bedroom window.

While "practical visionaries" such as Brunel, Stevenson and Roebling may have been "taking risks and taking society with them as they cut a path to the future", Cadbury never forgets those risking their lives just to survive. What makes this book a compelling read is the heroism and desperation of ordinary men.

Manjit Kumar's book Quantum will be published by Fourth Estate. To order Seven Wonders for £17 plus p&p call Guardian book service on 0870 066 7979.

Battling through the bends . . . Brooklyn Bridge

LOAD-DATE: November 8, 2003

LANGUAGE: ENGLISH

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Guardian Weekly

April 16, 2003

Challenging a golden rule of modern physics;
Faster Than the Speed of Light: The Story of a Scientific Speculation by Joao Magueijo;
Heinemann 320pp £ 16.99 (£ 14.99)

BYLINE: Reviewed by **Manjit Kumar**

SECTION: BOOKS; Pg. 17

LENGTH: 762 words

John Dryden's poem "Annus Mirabilis: The Year of Wonders", 1666, celebrated the Royal Navy's victory over the Dutch and the failure of the fire of London to consume the entire city. Yet as significant as these events are, they pale in comparison with one of the true high points of human achievement that occurred the same year: the 24-year-old Isaac Newton laid the foundations of calculus and the theory of gravity, and outlined his theory of light. Only one other year and one other scientist bear comparison with Newton and his annus mirabilis.

Albert Einstein's "miraculous year" was 1905. The unknown 26-year-old patent clerk produced -- in breath-taking succession -- the special theory of relativity, the quantum theory of light and a convincing argument for the existence of atoms. As preparations for the centenary get under way, Joao Magueijo has written a gripping account of his challenge to one of the central tenets of relativity and its implications for our understanding of how the universe works.

That the universe began with a "big bang" is something most of us accept, yet there remain puzzling features about the universe that the big bang theory cannot explain. Why does the universe look the same over such vast distances? Why is it so large? Why does it have the shape it has? Why does the universe exist at all? For years cosmologists have looked at the infant universe for "clues to its adult behaviour".

Some of these questions, Magueijo realised, could be answered if he broke just one golden rule. It was a simple solution to the cosmological problems, but it presented him with a problem of his own. For his answer "involved something that for a trained scientist approaches madness". What Magueijo proposed was that light travelled faster in the infant universe than it does now. In doing so he risked "career suicide" by questioning the validity of a perhaps the most fundamental rule of modern physics: that the speed of light is a constant.

Magueijo, a reader in theoretical physics at Imperial College, London, is no madman. But some have called him a heretic and dismissed his theory. After all the constancy of the speed of light is, as he points out, "woven into the fabric of physics, into the way that the equations are written". The reaction of his critics is understandable, since Magueijo's proposal would entail the wholesale revision of the entire framework of 20th-century physics.

Undaunted by the hostile reactions, Magueijo continued to investigate the possible consequences of a varying speed of light (VSL) in the very early universe. Whereas others may have been intimidated, he had the courage to follow where VSL led. Disappointingly, "for a long while it led nowhere".

Once he teamed up with the American cosmologist Andy Albrecht, new avenues began to open up through regular brainstorming sessions. At the end of each session, conducted behind locked doors, the blackboard calculations were wiped clean. They wanted to keep their ideas under wraps until they were ready to publish a fully fledged theory, since "publish first or perish" is a sad fact of a life for all scientists.

Magueijo provides a highly readable account of the problems besetting modern cosmology and how they appear to be resolved by VSL. Better still, he gives an honest and revealing insight into what it is like to carry out scientific research: the frustrations, the fear of being beaten by competitors, the ebb and flow of tension between collaborators, the numerous dead ends, the unexpected moments of inspiration, and the often tedious task of checking and rechecking calculations.

Finally, Magueijo offers a glimpse into the often fraught process of peer review that begins after an article is submitted to a journal for publication.

Magueijo finds it difficult to conceal his contempt for the reports written by referees that are at the heart of peer review. For him they are "often empty of scientific content and reflect nothing but the authors' social standing, or their good or bad relations with the referee". In fact so scathing was he about one well-known journal that the libel lawyers were called out, and the original print run of the British edition of his book was shredded.

Whatever the final verdict on VSL, where experimental results will act as the ultimate referee, Magueijo and his collaborators have developed a theory that, against the odds, is now being taken seriously. As the young Einstein once remarked: "Foolish faith in authority is the worst enemy of truth."

LOAD-DATE: April 22, 2003

LANGUAGE: ENGLISH

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The Guardian (London)

March 29, 2003

SATURDAY REVIEW: Summing up the universe: Manjit Kumar is gripped by a challenge to one of the central tenets of modern physics

BYLINE: **Manjit Kumar**

SECTION: Guardian Saturday Pages, Pg. 13

LENGTH: 857 words

Faster Than the Speed of Light: The Story of a Scientific Speculation by Joao Magueijo 320pp, Heinemann, pounds 16.99

John Dryden's poem "Annus Mirabilis: The Year of Wonders", 1666, celebrated the Royal Navy's victory over the Dutch and the failure of the great fire of London to consume the entire city. Yet as significant as these events are, they pale in comparison to one of the true high points of human achievement that occurred during that same year: the 24-year-old Isaac Newton laid the foundations of calculus and the theory of gravity, and outlined his theory of light. Only one other year and one other scientist bear comparison with Newton and his annus mirabilis

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Once he teamed up with his first collaborator on VSL, the American cosmologist Andy Albrecht, new avenues began to open up through regular brainstorming sessions. At the end of each session, conducted behind locked doors, the blackboard calculations were wiped clean. They wanted to keep their ideas under wraps until they were ready to publish a fully fledged theory, since "publish first or perish" is a sad fact of a life for all scientists.

Magueijo provides a highly readable account of the problems besetting modern cosmology and how they appear to be resolved by VSL. Better still, he gives an honest and revealing insight into what it's like to carry out scientific research: the endless frustrations, the fear of being beaten by competitors, the ebb and flow of tension between collaborators, the numerous dead ends, the unexpected moments of inspiration, and the often tedious task of checking and rechecking calculations.

Finally, Magueijo offers a glimpse into the often fraught process of peer review that begins after a finished article is submitted to a journal for publication. He and Albrecht had to bite the bullet, more than once, through a year-long review process, before their paper was finally accepted.

Magueijo finds it difficult to conceal his contempt for the reports written by referees that are at the heart of peer review. For him they are "often empty of scientific content and reflect nothing but the authors' social standing, or their good or bad relations with the referee". In fact, so scathing was he about one well-known journal that the libel lawyers were called out and the original print run of the UK edition of his book had to be shredded.

Whatever the final verdict on VSL, where experimental results will act as the ultimate referee, Magueijo and his collaborators have developed a theory that is now being taken seriously, against all the odds. As the young Einstein once remarked: "Foolish faith in authority is the worst enemy of truth."

Manjit Kumar's book Quantum will be published next year by Fourth Estate. To order Faster Than the Speed of Light for pounds 14.99 plus p&p call Guardian book service on 0870 066 7979.

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The Times Higher Education Supplement

November 24, 2000

So You Don't Think You Need Poetry?

BYLINE: Susan Blackmore

SECTION: SCIENCE JOURNALS; BOOKS; No.1463; Pg.42

LENGTH: 927 words

Prometheus. Edited by **Manjit Kumar.** Prometheus Publishing. www.prometheus.demon.co.uk Four times a year Pounds 8.99 each. Pounds 27.00 (individuals) Pounds 95.00 (institutions) - ISSN 1464 3901.

Prometheus is a new magazine with an ambitious aim - to provide deep coverage of the arts, sciences and humanities and to become a forum for debates that will bridge C. P. Snow's famous two cultures, the sciences and the arts. The production is excellent, and the list of names on the editorial advisory board quite stunning. Where else would you find Jacques Derrida alongside Sir Roger Penrose, or Noam Chomsky next to complexity theorist John Casti?

I headed first for the major science pieces and found well-written, dense and detailed articles. A good example is Brian Greene's "Strings and the fabric of spacetime" on the quest for a theory of everything. This, like a few of the other articles, serves as a kind of Reader's Digest, covering much of the material in Greene's bestselling book, The Elegant Universe. But why should we make the effort to understand all this? One reason, he suggests, is a basic assumption of science that the universe is a comprehensible place. As quantum mechanics and general relativity are incompatible, neither can be the final word and something has to be wrong, so we are forced to look ever deeper. Another is that we may thereby understand the extreme conditions of the big bang with which our universe began. String theory might even complete the search for the deepest laws of the universe.

Other features are not so easily categorised as either science, arts or humanities, fulfilling Prometheus's promise of bridging the gaps. These include Penrose's exploration of the role played by mathematics in music and painting, and Simon Singh's fascinating tale of how Andrew Wiles devoted his life to solving Fermat's infamous last theorem.

Then there is Norman Levitt's challenging exploration of the relationship between science and democracy, Roger Newton's defence of science against the social constructionists, and Charles Jencks's celebration of what has been called the building of the century, with its flowing forms and sculpted spaces: Frank Gehry's Guggenheim Museum in Bilbao. I especially enjoyed David Duncan's "Ten days lost forever", a history of calendars and their reformation, and the story of one day in October 1582 when the calendar jumped ten days. Reading it on the weekend the clocks went back, wondering if it was ten o'clock or only nine, I sympathised with the people who feared they were about to lose ten days of their lives.

Who needs poetry? I guess I never thought I did, but Seamus Heaney, in "The healing fountain", argues persuasively that we do. And from Ted Hughes, one of the original supporters of the magazine, we learn how

to memorise poems in ways that are much more fun than the kind of rote-learning most of us were forced to do at school. I must admit that once drawn into the magazine I found myself reading and learning about topics that I would never normally come across.

The forum sections have some serious debates, taken equally seriously by some of the people most closely involved. But some were just too much for me. I turned with anticipation to "The information age", a critical review by three sociologists of Manuel Castells's trilogy of the same name. But whereas struggling with the superstrings had amply repaid me with greater understanding, this one did not.

In "Risk and the risk society", Frank Furedi bemoans our obsession with avoiding risk as part of an all-pervasive, destructive culture of fear, while Ulrich Beck argues that this intense awareness of risk is positive and creative. In "Human cloning", Lee Silver, who is famous for his extraordinary predictions for how genetic engineering might affect future societies, debates with Ian Wilmut, the creator of Dolly, the first cloned sheep. While Wilmut argues for prohibiting the copying of a person, Silver responds that cloning never means copying a person and Wilmut's fears are unfounded. Interesting questions are raised in this debate. If a baby dies, would it not be wonderful for the parents if a clone could replace the child? But if human clones were allowed, what would it be like growing up knowing that the person with the same genes as you was brilliant throughout life, but began suffering from arthritis at age 50 and died of a heart attack at 70?

Global warming is another hot topic for a forum, and I much enjoyed this debate. On one side, Patrick Michaels and Robert Balling argue that the recent effects of human activity on climate are tiny and insignificant, that humans have been changing the climate since the first hominid cleared a patch of land, and that the vast costs of emissions reductions cannot be justified because the much-feared emergency does not exist. On the other side, John King details the uncertainties involved in predicting climate change but concludes that we are right to fear the possible consequences.

Each issue includes details of the contributors, many illustrations (all in black and white) and thoughtful book reviews.

So does Prometheus fulfil its aims? By and large I would say yes, though whether there is a market for this level of material at a correspondingly high price is another matter. But if you want your mind fired with high-grade articles on a broad range of subjects, then Prometheus is for you.

Susan Blackmore is reader in psychology, University of the West of England, Bristol.

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The Irish Times

May 28, 1997, CITY EDITION

The appliance of science

BYLINE: By **MANJIT KUMAR**

SECTION: NEWS FEATURES; BOOK OF THE DAY; Pg. 18

LENGTH: 702 words

The End of Science By John Horgan Little, Brown, 324pp, Pounds 18.99 in UK

HAVE all the big questions been answered? Is the age of great discoveries behind us? Is there a final "theory of everything"? Billed as having "unrivalled access to the finest minds in contemporary science", John Horgan rounds up more than the usual suspects who, according to the subtitle of this book, are "lacing the limits of knowledge in the twilight of the Scientific Age". He draws upon an impressive cast to help answer such questions: Noam Chomsky, Roger Penrose, Stephen Jay Gould, E.O. Wilson, Francis Crick and Sheldon Glashow, to name but a few.

Horgan challenges the notion that science will eventually provide answers to all these questions and suggests that those scientists who are trying to do so are pursuing science in a speculative, post-empirical mode that he terms "ironic science". But "ironic science", he warns, will not give us "the answer, the final truth that would quench our curiosity for ever".

Science for Horgan should concern itself with questions that, in principle, can be answered. But that isn't what is happening in much of modern cosmology which is, for Horgan, ironic science par excellence. It's science which is neither experimentally testable nor resolvable even in principle, and should therefore be regarded not as science in the strict sense, but something more akin to literary criticism and philosophy.

Cosmologists, says Horgan, will never be able to answer questions such as: How was the universe created? Is our universe just one of an infinite number of universes? All they can offer are opinions which provoke further discussion. This, from an American science journalist and staff writer on the magazine Scientific American, is unexpected.

Horgan weaves skilful and often entertaining portraits of his star-studded case, explaining the science succinctly and accessibly in the process. This is no mean feat, ranging as it does from super-strings, consciousness, neural Darwinism, wormholes and baby universes to artificial intelligence. This is a well-paced, well-written book of enormous scope. Individual chapters deal with the end of progress, philosophy, physics, cosmology, evolutionary biology, social science, neuroscience, chaoplexity, limitology and machine science. Sadly the final chapter, "The Terror of God", contains what he admits is the "woo-woo stuff".

Horgan draws heavily upon Harold Bloom's 1973 essay "The Anxiety of Influence", in which the modern poet is likened to Satan in Milton's Paradise Lost. Just as Satan fought to assert his individuality by defying the perfection of God, so the modern poet is engaged in an Oedipal struggle to define herself in relation to Shakespeare and other giants of the past. This is futile, Bloom warned, because no poet can hope to match, let alone surpass, the perfection of the past. Modern poets are tragic latecomers.

Horgan believes that modern scientists are latecomers too. They must endure Newton's laws of motion, Darwin's theory of natural selection and Einstein's theory of general relativity. There are no great discoveries over the horizon to compare with these; "pure science, the quest for knowledge about what we are and where we came from has already entered an era of diminishing returns. By far the greatest barrier to the future progress in pure science is its past success. No one ever said that science at the cutting edge was easy, but to suggest that "The End of Science" is at hand because science is the victim of its own success seems, well, ironic.

The modern era of scientific advance, Horgan suggests, was the result of a unique "convergence of social,

intellectual and political factors." He's right. Yet until the end of the nineteenth century, it was a common assumption that scientific advance and social progress marched hand in hand; the scientific revolution was the product of dynamic social progress and at the same time an essential contributor to that progress. If there is an "End of Science" it is likely to be as a result of social and political factors rather than anything to do with the past success or failure of science. Now that would be an ironic end.

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The Times Higher Education Supplement

February 2, 1996

Brave new worlders; Philosophy; Books

BYLINE: MARTYN KELLY

SECTION: Issue 1213, Pg.28

LENGTH: 773 words

SCIENCE AND THE RETREAT FROM REASON by John Gillott and **Manjit Kumar** Merlin Press 287pp, Pounds 18.95 and Pounds 10.95 ISBN 0 85036 433 7 and 451 5.

The philosophy of science,' a wag once wrote, 'is about as much use to a scientist as ornithology is to birds.' For 'philosophy' one might equally well insert 'history' or 'sociology' but the message from the laboratory bench is clear. Scientists have to believe in their own objectivity if they are to succeed. Yet the humanities come to science bearing a new heresy called 'cultural relativity'. What, after all, is this 'truth' for which scientists strive? And why, in the late 20th century, is science more likely to be associated, in the popular imagination, with Hiroshima and Chernobyl than it is with the eradication of smallpox?

We scientists work in a social and political environment that seems increasingly hostile to what we do. It is not that science is failing to produce the goods: there is now the prospect through molecular biology (to use one example) to breed better crops, cure diseases and even predict in advance whether a foetus will have a genetic disease. But instead of welcoming such advances, the public's reaction is often sceptical.

'The central aim of this book,' the authors write in the introduction, 'is to put afresh the argument for human progress.' Progress, they argue, results from human actions. And these actions are going to throw up problems at the same time as they contribute solutions. 'Indeed,' they go on to say, 'it is only through the creative process of problem solving and identifying new problems that the dynamics of progress unfolds.' I take no issue with this argument. Yet, on reading further it appears they believe that this process is one for scientists only. Society is excluded.

'All in all,' they write towards the end of the book, 'intervention into biology, especially human biology, is

condemned today as never before - at just the point where its potential benefits are also unprecedented.' They comment on the outcry in 1994 when a 59-year-old woman had a baby: 'Why do Dollars people not I speak of the advantages, in terms of meeting human needs and aspirations, that the new Dollars fertility methods promise?'

Must society mutely applaud the ingenuity of the scientists responsible? Are questions about the social consequences of a teenager with a mother in her seventies not the legitimate concern of society at large? Of course they are.

Clearly there are strong antiscience trends in western society today. But does being antiscience necessarily mean being against progress? I think not. Environmental science has made enormous advances in the past 30 years. We understand now what the indiscriminate use of pesticides can do to ecosystems, for example, and this had led to a rethink of agricultural practice on a large scale. Progress must, occasionally, involve reversing out of a cul-de-sac of endeavour, rather than simply building bigger and better battering rams with which to forge ahead. Some of what the new technologies let us do was hitherto impossible but, in many cases, we can just perform old tricks much faster. Faster, perhaps than the ethical debate can keep pace. It is easy for scientists to interpret the resultant howls of anxiety as antiscience trends, particularly when the howls come gift-wrapped with quasi-mystical trimmings.

Unfortunately, the enticing prospect of a 'clear and intelligible introduction to modern scientific thought' (the claim on the jacket) is largely unfulfilled because of the authors' strong views. I was not convinced by their arguments that quantum mechanics, along with chaos and complexity theory, has reinforced the view that humans must concede to nature and cannot fathom its subtleties. The development of ecology in the past 30 years along with the enormous power of the electronic media for bringing man's most excessive attempts to master nature into the living room seem equally influential, yet receive relatively little attention.

Many scientists probably share Gillott and Kumar's concern about the rise of antiscience feelings in the West. Yet the challenge is not simply, as Gillott and Kumar pretend, to 'tackle the barriers to progress thrown up by society'. It is to learn to differentiate between the genuine ethical concerns that some of the new technologies raise and the kneejerk reactions of a disillusioned, postindustrial generation.

Martyn Kelly is a freelance environmental consultant and science writer. He was formerly a research fellow, department of biological science, University of Durham.

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The Times Higher Education Supplement

December 22, 1995

The simple truth about complexity; Homeview; Opinion

BYLINE: GEOFF MULGAN

SECTION: Issue 1207, Pg.12

LENGTH: 601 words

These days most disciplines keep themselves to themselves. They have their own theories, their own stars, their own bitter arguments. But every now and then a wave of ideas sweeps across the boundaries. Very, very occasionally, ideas sweep across the huge trench that separates the natural sciences from social science and literature.

We are now in one of those rare moments. Over the past decade, the theories of complexity and chaos have made an extraordinary transition from mathematics congresses to analyses of food prices, catching the imagination in remarkable ways. They have the great virtue of sounding comprehensible while also being fiendishly difficult to understand. Both scientists and their popularisers have served the ideas well, with examples such as Edward Lorenz's account, more than 20 years ago, of how the flap of a butterfly's wings in Brazil could set off a tornado in Texas. Even better, from the work of people like Benoit Mandelbrot, they have spawned their own aesthetic, in the multiplying fractal images that have now become part of the armoury of modern computer art.

Its not hard to guess why these ideas resonate so well with the 1990s. They seem to fit with a cultural mood that sees the world as somewhat out of kilter, no longer predictable and controllable.

But before complexity colonises other disciplines it is worth asking just how well it has done, what answers it has provided. Should we be pumping more research funds into understanding complexity in economies or organisation theory, into non-linear analysis of social systems? Or is this just a fad?

An excellent new book offers a good corrective to the hype. Science and the Retreat from Reason by John Gillot and **Manjit Kumar** shows that, despite all the rhetoric, the achievements of the new complexity theories are limited. There have certainly been some successes in biology and physics, but there is not one usable theory in economics or the other social sciences, not one example of where complexity theories or non-linear approaches offer better insights than what could be termed approaches that look for 'linear relationships with noise' - that is, things which are messy but not chaotic.

That should be grounds enough for caution. But the other reason for scepticism is that some of the complexity theorists are trying to make a religion out of it. The world, we are told by writers such as Stuart Kauffman, naturally tends towards complexity, driven almost by a hidden force of nature that tends to take things from the simple to the complex, from the molecule to the crystal, the amoeba to the human being. We are being offered a new unifying vision that will not only, in the words of Ilya Prigogine, confirm 'the growing coherence of our knowledge of man and nature' and bring an end to the dangerous divorce of the natural and human sciences, but also build a bridge between scientific knowledge and theological belief.

This may be all wishful thinking. Human phenomena may just turn out to be different from non-human ones, and the attempts to find a new life force, a single explanation of how things are, may turn out to be as doomed as previous ones. Not that it is wrong to think much harder about complexity and about how systems interconnect, or about how analogies from the natural sciences can inform our understanding of human societies. It is just that we should be wary of sellers of complexity whose real attraction, ironically, is that they make everything neat and simple again.

Geoff Mulgan is director of Demos, the independent think tank.

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