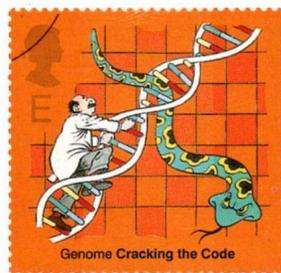
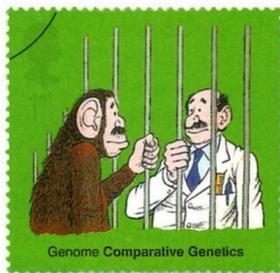


The Secret of Life A new stamp issue and a



Technical details

Printer Joh Enschedé
Security Print

Process Lithography

Size 37 × 35mm

Sheets 50. Starting with this issue, the standard sheet size for special issues will be 50 rather than 100 stamps.

Perforation 14.5

Phosphor One band 2nd class, two bands others

Gum PVA

Gutter pairs Vertical

Plate numbers and colours

All E1 black, new blue, magenta, greenish yellow, plus azure (2nd), bright apple-green (1st), yellow-orange (E), bistre-yellow (47p), lavender (68p)

THE SECOND of this year's special stamp issues – on the subject of DNA and the Human Genome – goes on sale at Post Office branches and philatelic outlets and Royal Mail Tallents House from 25 February. Three of the five stamps are also included in a new prestige book issued the same day. The designs of the five stamps feature a humorous representation of scientists involved in: 2nd class The End of the Beginning of the Genome Project; 1st class Comparative Genetics; E (European rate) Cracking the Code; 47p Genetic Engineering; and 68p Medical Futures. The Queen's head and value/service indicator are positioned at top left, The Queen's silhouette facing right.

FIRST DAY FACILITIES Unstamped Royal Mail FDC envelopes will be available from main Post Office branches and philatelic outlets about a week before 25 February, price 25p. The cover can be used for the stamps and panes from the prestige book. Orders for serviced FDCs must reach Tallents House by the date of issue. Price £2.74 UK/£2.34 overseas with set of stamps; £3.43/£2.92 with label pane from prestige book. State whether Tallents House or Cambridge postmarks required. Collectors may send stamped covers on the day of issue to: Royal Mail Tallents House, 21 South Gyle Crescent, Edinburgh EH12 9PB, or Special Handstamp Centre, Royal Mail, Wexham Road, Slough SL1 1AA (Cambridge postmark), marking the outer envelope 'FD0305' or 'FD0306'. Covers can be posted or handed in at main Post Office branches for the Cambridge postmark. Sponsored handstamps will be announced in the *British Postmark Bulletin*, available on subscription from Tallents House. For a sample copy write to: The Editor, British Postmark Bulletin, Royal Mail, 148 Old Street, London EC1V 9HQ.

PHILATELIC PRODUCTS A well-illustrated pack (price £2.35) and stamp cards (25p each) will be available from main Post Office branches and philatelic outlets and Tallents House.

A coin cover will be available from Tallents House, price £13.95. This commemorates the 50th anniversary of the discovery of the DNA Double Helix and bears the five new stamps cancelled by a special Cambridge 'fingerprint' postmark. The cover encapsulates the new Royal Mint £2 coin showing the Double Helix on the obverse.



Postmark for the coin cover.



Panee here and on p157 are shown at proof stage.

It has been suggested that the specific pairing we have postulated suggests a possible replicating mechanism for the genetic material.

Crick and Watson (Haber, 1953)

Nothing exists except atoms and empty space; everything else is opinion.

Democritus c.400 BC

Microcosmos The new PSB contains four panes, as follows.

Pane 1 Top and bottom rows: Two 1st class Machin definitives in gold separated by Machin E definitive. Middle row: Two E definitives separated by label showing DNA sequencing. The pane margin shows a fly by Robert Hooke.

Pane 2 Top row: 2nd and 1st class Secret of Life stamps; Bottom row: 1st and 2nd Secret of Life stamps. Pane margin shows peas – plant hybridization.

Pane 3 Four Secret of Life E stamps. Pane margin shows DNA.

Pane 4 Top and bottom rows: Two Northern Ireland 2nd class stamps separated by Northern Ireland 1st class stamp. Middle row: Two NI 1st class stamps separated by NI 2nd class stamp. Pane margin shows an atom.

PRESTIGE BOOK A new prestige book, entitled *Microcosmos*, will be available from 25 February, price £6.99. This will contain four panes, as left. Pane 1 is printed in gravure, the other panes and text pages in litho, all by Joh. Enschedé Security Print. This is the first time Enschedé have printed the 1st class gold gummed definitive and the two Northern Ireland stamps. The text for the prestige book is by science writer Susan Aldridge; it was designed by CDT Design Limited of London who also designed the *Across the Universe* (Astronomy) prestige book ●

DNA and the Human Genome Project In 1953 Francis Crick announced 'We have discovered the secret of life'. The uncovering of the structure of DNA triggered a scientific revolution. Crick and the American James Watson, working together in Cambridge, found that DNA was a double helix linked over and over again by the same four bits of chemistry; they had identified both the code of all life and how it copies itself. The sequence of A, T, G and C spells out the genes that turn a single cell into a bean, a barnacle or a baby, and then make each bean, barnacle or baby different from any other. Crick and Watson laid the foundations for the Human Genome Pro-

ject. With Maurice Wilkins, they were awarded the Nobel Prize for Physiology or Medicine in 1962. The molecular structures in DNA decoding featured on the 199 Scientists' Tale stamp in the Millennium series (below right). Crick has featured on stamps from Guyana and the Marshall Islands, issued respectively in 1995 and 1999.

Cells contain all the instructions for building a human being, in the form of DNA concealed in the nucleus. Within the nucleus, DNA is arranged in 23 pairs of rod-like packages called chromosomes. Each chromosome has a tightly-packed strand of DNA. DNA is composed of four chemicals (nucleotides) paired with one another repeatedly to form a twisted ladder shape, called a double helix. A gene is a string of nucleotides spelling out how to make a protein at a particular location on a chromosome.

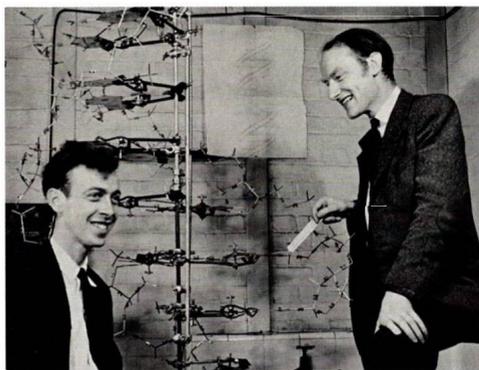
The Human Genome Project is an effort by the UK, USA, Japan, France, Germany and China to decipher the entire genome of a 'representative' human. This DNA sequence is 3 billion letters long, and contains the code for more than 30,000 genes. The first draft was completed in 2000; the aim is to have finished a 'gold standard' text by the 50th anniversary of Crick and Watson's discovery in 2003.

DNA is in the chromosomes of every living cell. Each human cell contains 6 feet of DNA. There are 100 million million cells in an adult body, so the DNA of just one person, if spun into a single thread, would stretch to the Sun and back 600 times.

Each individual's genome differs very slightly, although geneticists have pinpointed over 1 million of the tiny variations in genes that make each person different from all the other humans that ever existed. These minute distinctions explain why some people develop certain diseases or how they respond to drugs. This opens a future of 'personalised' medicine, and new research into Parkinson's disease, cancer or inherited genetic disabilities.

The human genome is so long that it can only be published on the internet and read by computer. If typed on A4 paper, it would fill 750,000 pages! The Project called for massive advances in computing and automation, stimulating a new branch of biology called bioinformatics. Researchers already know the DNA for tuberculosis, syphilis, bubonic plague, cholera, malaria, and meningitis. The cancer genome project has discovered more than 100 genes specifically linked in some way with tumours.

DNA is a personal signature as well as a badge of kinship. A British scientist, Professor Sir Alec Jeffreys, first used DNA 'fingerprinting' to help solve a murder in 1987. DNA science routinely clears up paternity disputes, identifies human remains and establishes historic family ties. Genetically-modified crops – with genes for added resistance to pests or to herbicides – are already grown widely in North America and Asia. The debate over this attracts strong opinions on both sides ●



The discoverers of the structure of DNA, James Watson (left) and Francis Crick, with their model of part of a DNA molecule in 1953. Combining their own work with that of Maurice Wilkins and Rosalind Franklin led them to deduce that DNA exists as a double helix.



Molecular structures in DNA decoding featured on the 199 Scientists' Tale stamp in the 1999 Millennium series.