



Albrecht Dürer's 1514 masterwork is rife with symbolic references to astronomy, geometry and chemistry.

## CULTURE

# Artistic alchemy

**Philip Ball** unveils the scientific iconography in Albrecht Dürer's enigmatic engraving *Melencolia I*.

Albrecht Dürer's *Melencolia I*, engraved in 1514, seems an open invitation to the cryptologist. Packed with occult symbolism from alchemy, astrology, mathematics and medicine, it promises hidden messages and

recondite meanings. What it really tells us, however, is that Dürer was a philosopher-artist of the same stamp as Leonardo da Vinci, immersed in the intellectual currents of his time. In the words of art historian John Gage, *Melencolia* is "almost an

anthology of alchemical ideas about the structure of matter and the role of time".

Dürer's brooding angel is surrounded by the instruments of the proto-scientist: a balance, an hourglass, measuring calipers, a crucible on a blazing fire. Here, too, is numerological symbolism in the 'magic square' of the integers 1–16, the rows, columns and main diagonals each adding up to 34: a common emblem of both folk and philosophical magic. Here is the astrological portent of a comet, streaming past an improbable rainbow, a symbol of the colour-changing processes of the alchemical route to the philosopher's stone. And here is the title itself: melancholy, associated in ancient medicine with black bile, the same colour as the material with which the alchemist's Great Work to make gold was supposed to begin.

But why the tools of the craftsman — the woodworking implements in the foreground, the polygonal block of stone awaiting the sculptor's hammer and chisel? Why the tormented, introspective eyes of the androgynous angel?

*Melencolia I* is part of a trio of complex copperplate etchings that Dürer made in 1513–14. Known as the Master Engravings, they are considered collectively to raise this new art to an unprecedented standard of technical skill and psychological depth. This cluttered, virtuosic image is often said to represent a portrait of Dürer's own artistic spirit. Melancholy, often considered the least desirable of the four classical humours then believed to govern health and medicine, was traditionally associated with insanity. But during the Renaissance it was reinvented as the humour of artistic temperament, originating the popular link between madness and creative genius. The German physician Cornelius Agrippa, whose influential *Occult Philosophy* (written around 1510) Dürer is almost certain to have read, claimed that "celestial spirits" were apt to possess the melancholy man and imbue him with the imagination required of an "excellent painter".

The connection to Agrippa was first made in 1943, by the art historian Erwin Panofsky, doyen of symbolism in art. He argued that Dürer's angel is vexed by the artist's sense of failure: an inability to fly, to exceed the bounds of the human imagination and create the truly wondrous. As a consequence, her tools lie abandoned.

Why astronomy, geometry, meteorology and chemistry should have any relation to the artistic temperament is not obvious today. But in the early sixteenth century, the connection would have been taken for granted by anyone familiar with the Neoplatonic idea of correspondences in nature — the notion that all natural phenomena, including the predispositions of humanity,

are joined in a web of hidden forces and symbols. The humour melancholy, for instance, is governed by the planet Saturn, whence the word 'saturnine'.

So there would have been nothing obscure about this picture for its intended audience of intellectual connoisseurs. Dürer mastered and exploited the new technologies of printmaking, so he was able to distribute his works widely, and he indicated in his diaries that he sold many and gave others as gifts to friends and humanist scholars such as Erasmus of Rotterdam. Ferdinand Columbus, son of Christopher, collected more than 3,000 prints, 390 of them by Dürer and his workshop.

Although the alchemical imagery of *Melencolia I* was part of this engraving's 'occult parcel', it would be wrong to imagine that alchemy was, to Dürer and his contemporaries, purely an esoteric art. As Lawrence Principe has argued in *The Secrets of Alchemy*

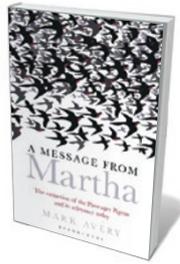
**“There would have been nothing obscure about this picture for its intended audience of intellectual connoisseurs.”**

(University of Chicago Press, 2012), this precursor to chemistry was not only, or even primarily, about furtive and futile attempts to make gold from base metals. It was also a practical craft, not least in providing artists with their pigments. For this reason, artists commonly knew something of its techniques; Lucas Cranach the Elder, a friend of Dürer's, was a pharmacist on the side, which may explain why he was almost unique in northern Europe in using the rare and highly poisonous yellow pigment orpiment, an arsenic sulphide. The extent of Dürer's chemical knowledge is not known, but he was one of the first artists to use acids for etching metal, a technique developed only at the start of the sixteenth century. The process required specialist knowledge: it typically used nitric acid, made from saltpetre, alum and ferrous sulphate, mixed with 'Dutch mordant' composed of dilute hydrochloric acid and potassium chlorate.

Humility should perhaps compel us to concur with art historian Keith Moxey that “the significance of *Melencolia I* is ultimately and necessarily beyond our capacity to define” — we are too removed from it now for its themes to resonate. But what surely endures in this image is a reminder that for the Renaissance artist there was continuity between theories about the world, matter and human nature, the practical skills of the artisan, and the business of making art. ■

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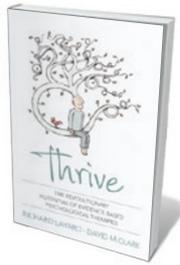
## Books in brief



### A Message from Martha: The Extinction of the Passenger Pigeon and its Relevance Today

Mark Avery BLOOMSBURY (2014)

A century ago, Martha — the last of the passenger pigeons (*Ectopistes migratorius*) — died in a zoo in Cincinnati, Ohio. Less than 100 years before, the species had been Earth's most common bird, darkening the sky and pulling down trees with the sheer size of its colonies. Conservationist Mark Avery's chronicle is based on science, historical accounts, a 6,000-kilometre road trip to key US sites, and numerous interviews. It offers a considered perspective on the habitat loss and unsustainable harvesting that led to the pigeon's demise.



### Thrive: The Revolutionary Potential of Evidence-Based Psychological Therapies

Richard Layard and David M. Clark ALLEN LANE (2014)

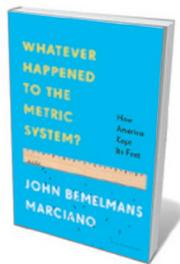
More than 350 million people worldwide have depression, estimates the World Health Organization. Yet mental illness is a policy blind spot and access to treatment is poor — a “shocking form of discrimination”, say psychologist David Clark and economist Richard Layard. Drivers of the UK Improving Access to Psychological Therapies initiative, they make the case for tackling the burden now, and draw up a road map for evidence-based therapies recommended by the UK National Institute for Health and Care Excellence.



### Extracted: How the Quest for Mineral Wealth Is Plundering the Planet

Ugo Bardi CHELSEA GREEN (2014)

Our dependence on fossil fuels and minerals is growing ever more costly, as extraction rapidly creams off the “easy” deposits. So argues physical chemist Ugo Bardi in this in-depth study of the issue, based on a report to the Club of Rome, a global think tank. Bardi examines depletion models, pollution and climate change, the viability of mining oceans or asteroids, and options such as waste recycling. If rampant extraction persists, he notes, we will not need spaceships to find a new world: we'll be standing on it, and it will not be pretty.



### Whatever Happened to the Metric System?: How America Kept Its Feet

John Bemelmans Marciano BLOOMSBURY USA (2014)

Miles and pounds are here to stay — in the United States, at least. Its measurement system survived an abortive federal metric initiative in the 1970s and 1980s and, writer John Bemelmans Marciano reveals in this digressive history, a much earlier attempt. In 1790 Thomas Jefferson hoped to follow up his decimal currency with a decimal system of weights and measures. Instead, it was US ally post-revolutionary France, burdened with a hideously complicated system of weights and measures, that authored the metric system.



### The Amazing World of Flyingfish

Steve N. G. Howell PRINCETON UNIVERSITY PRESS (2014)

The more than 60 species of the family Exocoetidae literally sail the seas — or, more accurately, just above them. The streamlined bodies of flying fish lend them underwater speed that they can convert into lift; winglike pectoral fins allow them to glide as far as 180 metres to escape predators. They can even use updraughts of air. Ornithologist Steve Howell's engrossing natural history is embellished with 90 superb colour photographs of the ornate goldwing and other beauties among these “ocean butterflies”. **Barbara Kiser**