

The original 1900–01 dive was the first archaeological exploration of a wreck, undertaken decades before Cousteau’s invention of the scuba apparatus. After describing its drama, Marchant turns to the scholars from many countries who tried to date and interpret the mechanism over the next century. In the 1960s and 1970s, the leading investigator was the late science historian Derek de Solla Price of Yale University, who published *Gears from the Greeks* (American Philosophical Society, 1974). Since the 1990s, two rival explanations have emerged: one from Michael Wright, a former curator at the Science Museum in London, who is inspired by de Solla Price, and the other from the multidisciplinary team that published in *Nature*, led by mathematician and film-maker Tony Freeth and Mike Edmunds, an astronomer at Cardiff University. Marchant’s handling of the rivalry is excitingly tense.

Damaged Greek inscriptions initially dated the mechanism to between the second century BC and the second century AD. Radiocarbon analysis dated the ship’s wooden hull to between 260 and 180 BC, although the ship could have sailed later. The design of the wreck’s pottery amphorae narrowed the date to the first half of the first century BC. Silver and bronze coins found by a second Cousteau expedition in 1976 showed the ship sank between 70 and 60 BC, probably while sailing from Pergamon, on the coast of Asia Minor, towards Rome.

The mechanism was initially thought to be an astrolabe. But its gear wheels suggested another use, as astrolabes do not need gears. De Solla Price imagined it was a calendar computer, but this did not explain the ratios of teeth on the gears. Wright now favours a planetarium explanation, whereas Freeth’s team believes it is an instrument for predicting eclipses. Freeth prefers to call it a ‘calculator’ rather than a ‘computer’, whereas Marchant, following historian Doron Swade’s definition that a computer can display its calculated numbers on a scale, uses the latter. In both explanations, the mechanism’s builders assumed that Earth is at the centre of the heavens, as believed by Greek astronomers and philosophers except for the heliocentric Aristarchus of Samos, and

that the movement of the heavenly bodies is based on epicycles.

Marchant’s fascinating final chapter asks who made it, and why. The inventions of Archimedes in the third century BC might have influenced it; an epigraphic analysis published earlier this year hints at a link with his home city of Syracuse (T. Freeth *et al. Nature* 454, 614–617; 2008). The astronomer Hipparchus may also have inspired its design, but was probably dead before its construction. The philosopher Posidonius, who lived at the right time, is a strong candidate; his student Cicero mentions that Posidonius built an instrument that reproduced the “motions of the Sun, the Moon and the five planets”.

The mechanism’s purpose may have been for astrology, in which Hipparchus apparently believed, but more likely it had no practical use. Like the orreries of the Enlightenment, it was probably one among many luxury gadgets for the educated Greek and Roman elite — the only example of its kind to survive. “The Antikythera Mechanism,” Marchant concludes, “was originally meant as a celebration of the heavens.” ■

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## Liver satire delivers

### Liver: A Fictional Organ with a Surface Anatomy of Four Lobes

by Will Self  
Viking; 2008. 288 pp. £18.99

We live, by and large, Panglossian lives, naively reading purpose into the world, and into ourselves. Confronted by our bodies, we wonder at their watch-like precision. Each part of us does something. A heart pumps blood. A skull shields the brain. Eyes see. Hands grip.

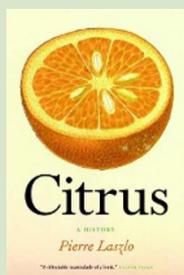
When we look at the liver, however, we see not a tool for living, but a living thing — and this is an uncomfortable proposition. The liver has a plethora of functions: storage of the carbohydrate glycogen, decomposition of red blood cells, production of blood plasma proteins, detoxification, bile production — and that’s without even mentioning its regulatory abilities. It intimidates us by its efficient ubiquity.

Will Self’s new book, *Liver*, is not body horror in the science-fiction sense. For Self, as aficionados of the author will expect, *Liver* is satire. In his vision, our livers are more valuable than we are, more able, more alive. The liver is the only internal organ in the body that can regenerate itself to a significant extent. Yet

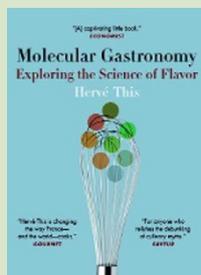
still we contrive, over the course of our lives, to squander its magnificent estate.

The four ‘lobes’ of Self’s book are individual stories — his strongest in years. With a little intertwining of narrative, his peculiar tales of abuse, disease and decay largely follow their own paths. Cirrhosis, cancer, hepatitis and, with a nod to Greek mythology, a vulture wander among the human protagonists as equals. Self’s satire is classical rather than radical, rooted more in Alexander Pope than Jonathan Swift. Diseased flesh takes plenty of collateral damage, but contemporary behaviour is Self’s real target. “Confronted with the nobility of feeling, high culture and deep spirituality”, Self — like the malevolent bar fly of his first story, ‘Foie Humain’ — “sees nothing but the stereotypic behaviours of anthropoid geese.”

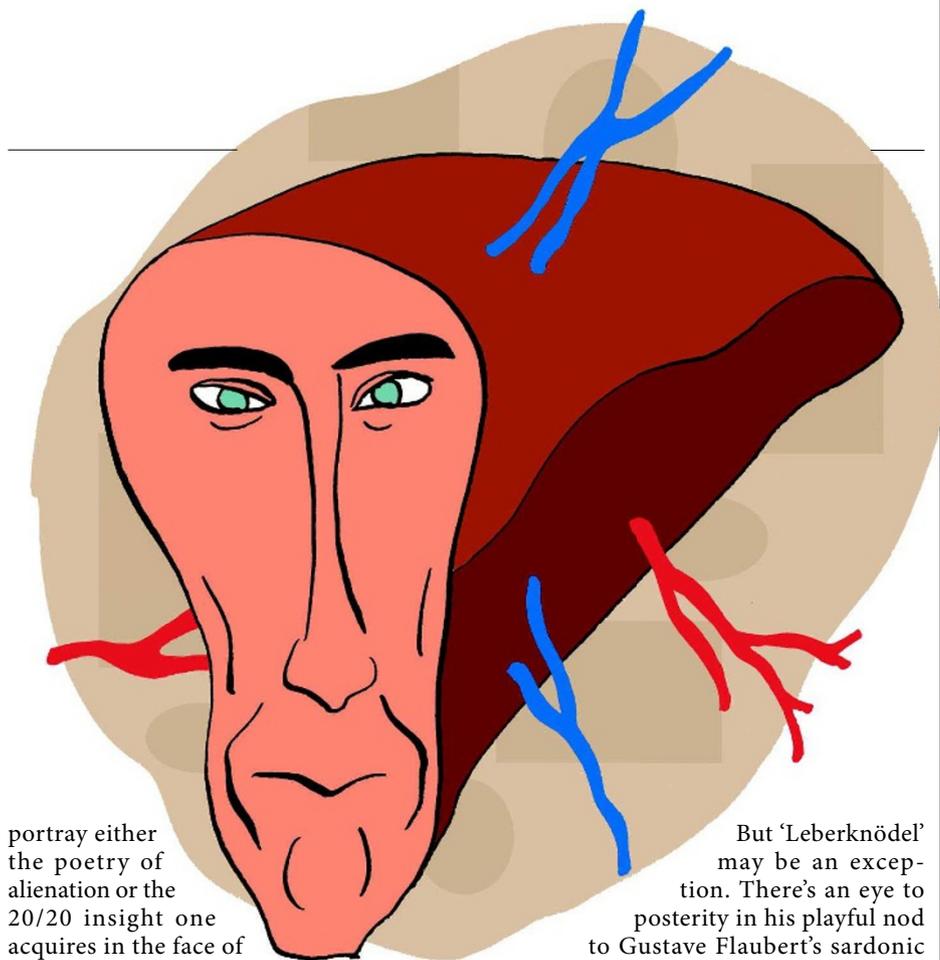
Satire depends for its success on a pitiless accuracy. Self’s prose veers between the appetizing and the nauseating, yet it is almost always on the nail: proof that the more accurately you describe a thing, the more surreal it seems. His vivid characters include a cancer sufferer being hustled towards her elective suicide by her daughter’s poor timekeeping, the determined alcoholic gorging of a hapless barman, and a dangerously unmotivated Harley Street hepatologist. These sketches



**Citrus: A History**  
by Pierre Laszlo (Univ. Chicago Press, \$17.00)  
Laszlo describes the chemistry of citrus fruits. “His succinct explanations of the Maillard and caramelization reactions when describing how to make marmalade, and his notes on foams, phase separation, and the volatility of aromas when explaining how to make a sabayon, justify the cost of the book on their own,” wrote Peter Barham (*Nature* 450, 479; 2007).



**Molecular Gastronomy: Exploring the Science of Flavor**  
by Hervé This (Translated by Malcolm DeBevoise) (Columbia Univ. Press, \$19.95)  
French experimental chef, This, opens up the kitchen to scientific experiments. In this enjoyable book, he debunks old rules and superstitions about cooking, and shows how food can be looked at, prepared, cooked and tasted in new ways.



portray either the poetry of alienation or the 20/20 insight one acquires in the face of approaching death.

Self plays both sides, nowhere more affectingly than in the collection's magnificent centrepiece, 'Leberknödel' (Liver Dumpings). Joyce, a retired hospital administrator, knew that her cancers would not stop "until they had toppled the sovereignty of consciousness itself, and replaced it with their own screaming masses of cancerous tissue". Appalled at the 'bad habit' of terminal decline, she arranges her own death. Seemingly reprieved, she finds, however, that her living has become as much of a bad habit as her dying. She looks objectively at her life — her world, her friends, her sot of a daughter — and realizes she has lost the empathic ability that gave her life its meaning. She has, essentially, already killed herself.

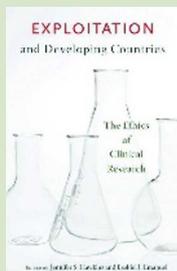
Self is not a writer who worries about the long-term value of his art, as that would distract him from the ephemera so essential to it.

But 'Leberknödel' may be an exception. There's an eye to posterity in his playful nod to Gustave Flaubert's sardonic

prose technique, gleefully italicizing every cliché passing through Joyce's dying mind. Like *Madame Bovary*, 'Leberknödel' mixes its scorn with warmth and sympathy. As a result, one gets a sense of the author's moral authority. Our bodies are not ours; nor are our feelings. We think our perceptions are ephemeral, but they are rooted in a physics that will outlast us. Joyce manages to argue herself away, destroyed by her own strength of purpose. This vision of humanity — too strong for itself, too clever by far — is more tragic than satirical.

For Self to kick the chair out from under himself in this way, turning his trademark scorn to tears of sympathy, is an achievement. *Liver's* grotesques are not meant to hold — but Joyce endures. ■

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### Exploitation and Developing Countries: The Ethics of Clinical Research

Edited by Jennifer S. Hawkins and Ezekiel J. Emanuel

(Princeton Univ. Press, \$14.95)

Scientists and philosophers delve into the moral implications of clinical research in developing countries. Different chapters examine case studies and look at the benefits and costs of clinical trials, both to the individual subjects and the different nations involved.