particle physics *is* a male culture (although saying so doesn't make it so), it is important to understand how it came to be that way and why it remains true. Traweek's summation is as cogent as the evidence that Beatles records, played backwards, contain messages of devil worship:

> The language used by physicists about and around detectors is genital: the imagery of the names SPEAR, SLAC, and PEP is clear, as is the reference to the "beam" as "up" or "down." One must see the magnets at LASS to appreciate the labial associations in the detector's name, Large Aperture Solenoid Spectrometer. Ironically, the denial of human agency in the construction of science coexists with the imaging of scientists as male and nature as female. Detectors are the site of their coupling: standing on the massive, throbbing body of the eighty-two-inch bubble chamber at SLAC while watching the accelerated particles from the beam collide twice a second with superheated hydrogen molecules made this clear to me.

The plethora of facts that Traweek has got wrong does nothing to encourage faith in her inductions. Descriptions of scientific apparatus, events and phenomena, intended to confer verisimilitude, are grossly inaccurate. Her judgements are no more convincing: the statement that the food at SLAC is "rather good, for a cafeteria" will come as a shock to anyone who has eaten there.

The neglect of the reasons that inspire people to join and remain in this community is a crippling omission. Particle physics is not a closed or isolated society in which membership is determined by happenstance. Because the only motive Traweek recognizes is career advancement, her narrative is oblivious to the excitement, the exhilaration of doing physics. Nowhere do we see people driven by curiosity, intoxicated with the creation and understanding of new experience.

Beamtimes and Lifetimes is not a complete or reliable guide to the community of particle physicists. Let it be taken nevertheless as an invitation to particle physicists to re-examine their values, institutions and assumptions about each other and about the rest of the world. □

Kate Metropolis and Chris Quigg are in the Superconducting Super Collider Central Design Group, Lawrence Berkeley Laboratory, Berkeley, California 94720, USA.

Life transformed

Adrian Desmond

The Age of Lamarck: Evolutionary Theories in France 1790–1830. By Pietro Corsi. Translated by Jonathan Mandelbaum. *University of California Press: 1988. Pp. 360. $42.*

AT THE entrance to the Jardin des Plantes, opposite the Seine, stands an imposing statue of Lamarck, the "Founder of the Doctrine of Evolution". And in relief, at the back, is a touching scene depicting a lonely, dejected Lamarck being consoled by his sister. This image, of an isolated trailblazing figure, is surely one of the most enduring in the history of biology.

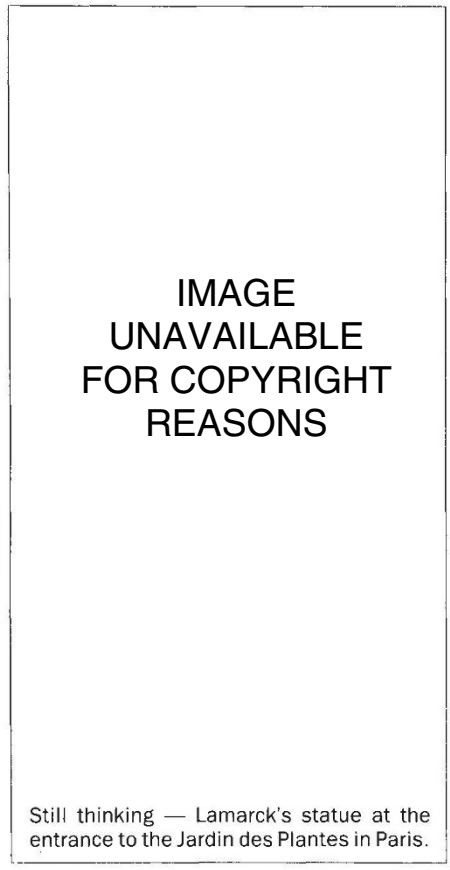
Now Pietro Corsi, in his stunning study of Parisian science after the Revolution, shatters this myth. He questions the long-standing assumption that Lamarck was a prophetic genius, striding alone, out of time and place. The truth was very different; so much so that Corsi actually talks of an 'evolutionary culture', of which Lamarck was but a part. And in investigating this culture, he has given us the most compelling account yet of French transformism between 1800 and 1830.

Historians have been quick to deny Lamarck an audience. But Corsi argues that the eighteenth-century buffonian tradition — with its grand, unifying view of nature and attempt to look at life through time — still had a populist appeal, even after the Revolution. And it was to the buffonians (most by then outside academia) that Lamarck spoke — to the marginal men appalled by the increasing specialization of science. They deplored Cuvier's attempt to subordinate natural history to a descriptive, analytical comparative anatomy. There were still plenty of these outsiders in 1800, criticizing Cuvier for failing to investigate the larger laws of nature. It was against this cultural background that Lamarck's own ambitiously theoretical works, with their rival approaches to *biologie* (his word), were formulated.

Lamarck started out as a botanist, chemist and conchologist, and he was appointed the professor of insects and worms at the Muséum d'Histoire Naturelle in 1793. Before 1800 he remained a staunch anti-transformist, adamant too that life and inorganic matter were separated by a chasm. Then suddenly in 1800 he switched tracks. His subsequent evolutionary views have always been difficult to interpret (if easy to parody). Corsi explains the origin and real meaning of Lamarck's ideas by tracing their development in detail through the critical period 1800–1802. By this means he is also able to show that, far from accepting spontaneous generation first, as historians had thought, Lamarck only warmed to it after shifting to evolution.

The fact that Lamarck rarely quoted or cited fellow authors has led to the belief that he was acting alone. But again Corsi introduces us to numerous other dissident intellectuals at loggerheads with the powerful Cuvier. Many rejected Cuvier's claim that some fossil animals were extinct, perhaps killed off by a marine inundation. Like Lamarck, they believed that these animals had simply changed their form in a gradually changing world. As a result, Corsi is able to show that Lamarck's famous *Philosophie Zoologique* (1809) was less an insular pioneering work than a running dialogue with his contemporaries.

Given this context, Lamarck's science makes sense. Of course there were inconsistencies. Lamarck had inordinate trouble squaring his progressing animal series with his non-progressionist geology; but, by the 1820s, a new generation had cast aside his old framework and mated evolution to a directionalist Earth history, which provided the environmental motor. There was also a good deal of frustration with the man himself: Lamarck exasperated even sympathizers with his pigheadedness, and they were less and less inclined to come to his aid. Even so, as Corsi says, he was never totally deserted by his friends, any more than he was completely ignored by his enemies, the way the old histories implied.



Boyer-Viollet

Still thinking — Lamarck's statue at the entrance to the Jardin des Plantes in Paris.

The Age of Lamarck was first published in Italy in 1983, and this translation (excellent in itself) has been well worth waiting for. Corsi makes Lamarck a man of his time, and that is no mean feat. For historians the result is a treat. But for Lamarck — pilloried and parodied for two centuries — it is long overdue justice. □

Adrian Desmond is in the Department of Biology, University College London, Gower Street, London WC1E 6BT, UK.