

the Invisible sacrifice sound science for sound bites — we are in the hands of a scholar and a true believer.

Chemistry is undergoing a renaissance as it enters the twenty-first century, and it has become apparent that molecules are the key to understanding other sciences such as medicine, biology, microelectronics and materials. The media will no doubt proclaim wonders in these areas in Science Year, and chemistry will perhaps, indirectly, make some progress in capturing minds, if not hearts.

Ball's heart is clearly in the right place, as his final sentences show: "It is often said that each age tends to interpret the world through models derived from its most advanced technology, and so maybe in the Age of Information we should be wary of becoming too dogmatic about ... questions that haunted Haldane, Schrödinger and countless others. It is perhaps more important that we regard this as a demonstration of the fabulously dynamic, interactive world inhabited, unseen and too often unsung, by molecules." ■

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New in paperback is Philip Ball's *The Self-made Tapestry: Pattern Formation in Nature* (Oxford University Press, £12.50, \$19.95).

Reading the history of humanity

The Seven Daughters of Eve: The Astonishing Story That Reveals How Each of Us Can Trace Our Genetic Ancestors/The Seven Daughters of Eve: The Science That Reveals Our Genetic Ancestry

by Bryan Sykes
Bantam Press/W. W. Norton: 2001. 320 pp.
£18.99/\$25.95

Howy Jacobs

Mitochondrial DNA represents a unique component of the genome. It is inherited in a strictly maternal fashion, and evolves much faster than nuclear DNA. These properties make it ideal for tracing the history of human populations, especially over the past 100,000 years, during which our species has gained effective mastery of the planet. Untainted by the informational scrambling implicit in sexual recombination, the mitochondrial DNA (mtDNA) represents, as Brian Sykes engagingly explains, a historical record of humanity, a silent witness to our migrations and tribulations.

The best part of the book is the first two-thirds, in which Sykes describes his



Ancient probings: DNA from the fossil bone of Neanderthal hominids may clarify our genetic origins.

endeavours in the field in a style rather like that of a detective story. He eschews strict chronological order (whether of human history or bench science), but presents the research in a logical manner. Human-interest chapters recording the key discoveries are interspersed with well-crafted explanations of basic concepts in cell biology, genetics and evolution. Apart from a few minor blemishes, such as his odd description of mtDNA as "a" gene, *The Seven Daughters of Eve* covers these topics in a way that is both scientifically accurate and understandable to the layperson.

In this first section, Sykes focuses mainly on his own contributions. These include the quest to isolate DNA from ancient specimens such as the celebrated Alpine Iceman, the grizzly work of identifying the remains of the Russian imperial family, the puzzle of where the Pacific islanders came from, the mysterious disappearance of the Neanderthals and, finally — the main story of the book — the ancestry of modern Europeans.

Sykes acknowledges his debt to others in the field — pioneers such as Rebecca Cann and Svante Pääbo, and co-workers such as Chris Stringer. On the other hand, Luca Cavalli-Sforza may find the chapter entitled "We are not amused", which deals with the long-running academic feud over European origins, rather more vexatious. However, Cavalli-Sforza finally agreed with Sykes that the gene pool of present-day Europeans comes predominantly from Palaeolithic hunter-gatherers, with only a minor contribution from early farmers who migrated into Europe during the Neolithic period. Sykes is gracious (in victory), however, and many other scientists will relate to the emotionally vivid way he portrays this battle of ideas.

The last part of the book, from which the title derives, is, correspondingly, slightly

disappointing. I found the accounts of the imagined lives of the seven founders of the major European mtDNA lineages (haplogroups) rather banal, at times verging on the puerile. The tales are marred by unfortunate anachronisms, such as the description of a successfully crafted flint tool as "a real peach", and simple inaccuracies, such as the ancient Mediterranean tide coming in. Sykes laces the stories with somewhat forced descriptions of the invention of agriculture, the development of ancient trading practices, cave art and the first boats. All this made me feel that I was reading someone's school project, with influences from *The Flintstones* cartoon series, rather than a treatise by a leading academic. I would have preferred a shorter account, based on specific archaeological findings, in the same style as the earlier chapters. But some readers may enjoy this semi-fictional diversion.

Sykes pours deserved scorn on the primitive genetic theories that inspired nineteenth- and twentieth-century racists. Yet the romanticism of his accounts of the seven clan-mothers comes rather close to achieving the opposite effect. I began to wonder whether this was leading up to a proposed resolution to the problem of the inexorably growing European Commission: instead of one commissioner from each member state, why not one from each of the seven matrilineal clans? Maybe that's not such a bad idea.

Despite these minor faults, and despite more academic criticisms that one might make of his data interpretation, this will be recognized as an important work, bringing molecular anthropology to a mass audience. ■

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