



First Australians: *Homo erectus australiensis* (?)

Eulogy for an unsung pioneer

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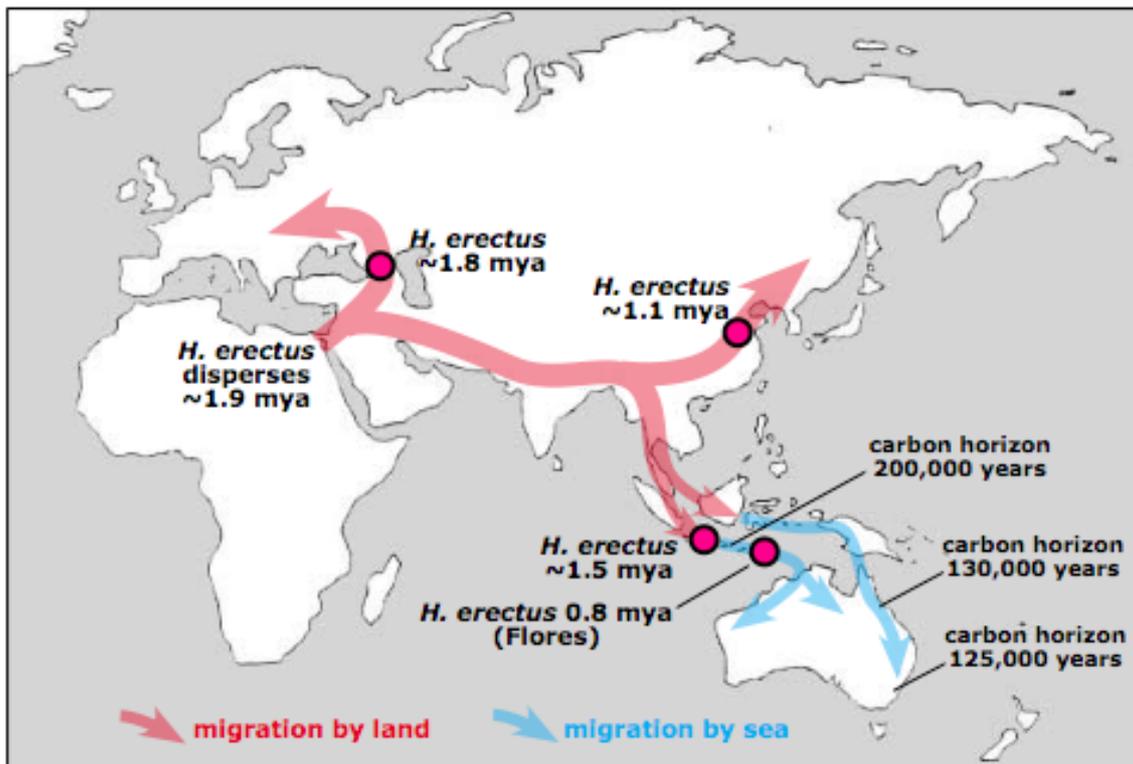
Archaic dispersal

On the Indonesian island of Flores the skeletal remains of a distinctively diminutive human form, *Homo floresiensis*, have been unearthed. The archaic architecture of the skull as well as the limb and brain proportions of this metre-tall species strongly suggests that it was a relic of the *H. erectus* line that had responded to its geographic isolation by shrinking—a common evolutionary strategy for island-based species. Yet some of the fossil material appears to be little more than 18,000 years old.

But this is where the story gets *really* interesting.....

Also on Flores, beside the remains of an ancient lake-bed, a vastly older human campsite has been found. It predates the evolution of modern humans by at least 600,000 years. **(1)**

Meanwhile, any migration from Java to Flores would have involved crossing at least three sea barriers the largest of which has never been much less than 20km (12 miles) wide. Similarly, travelling from Borneo to New Guinea via the loose island chains west of Sulawesi, or to Australia via the Wallacean islands and Timor, they would have faced several sea barriers, some of which were never less than 65km (40 miles) wide during the lowest sea levels, such as occurred about 140,000 years ago. **(2)**



Flores lies some 700km (430 miles) east of *H. erectus*' ancient Javan home and has never been attached to the main landmass of South-East Asia, even during the lowest glacial sea levels. The several straits that separate Java from Flores are relatively narrow, but they include the faunal divide known as Wallace's Line and they pose one of the most intriguing questions in palaeoanthropology: when and how did archaic humans become seafarers?

That they did indeed migrate by sea is no longer in doubt. In 2003 paleoanthropologists Mike Morewood, Peter Brown and several researchers

from universities in Australia and Indonesia, unearthed a number of hand-worked stone tools in a layer of sandstone beside an ancient Flores lake bed. Since the tool-bearing stratum was sandwiched between two layers of volcanic ash, dating this fossil site was a relatively simple process.⁽³⁾ The ash layers yielded ages of 800,000 and 880,000 years, so the archaic humans must have occupied the area during the volcanically dormant interval.

All the more intriguing then, is the discovery of some 50 archaic human skulls at widely separated Australian sites. If the message in these Australian skulls is to be taken at face value, it offers unassailable evidence of their ability to travel safely by sea and suggests that it was they and not a descendant form, *Homo sapiens*, that first colonised Australia.



FRONT: from Kenya, KNM ER-1470—***Homo habilis***, 1.88 million yrs old.
 CENTRE: from Kow Swamp, Victoria—***Homo erectus***, 13,000 yrs old.
 REAR: from Keilor, Victoria—***Homo sapiens***, 13,000 yrs old.

The accepted theory is that the centre skull is the same species as the fully modern human skull behind it. Yet its profile clearly suggests that its evolutionary links lie with *Homo erectus*, the widespread ancestor of our own species and a probable descendant of *Homo habilis*.

Australian skull casts courtesy of Dr. Alan Thorne, ANU.
 The KNM ER-1470 cast is courtesy of the Cleveland Museum of Natural History in Ohio, USA.

The first Australians

The first tenuous clue to the early arrival in Australia of these archaic explorers was unearthed in the sedimentary bed of Lake George, an ephemeral lake in south-eastern Australia. In the upper layers of sediment the percentage of carbon grains deposited as fallout from local bushfires is relatively high. Similarly, the pollen grains embedded with them are typical of modern Australia's fire-resistant vegetation. Little changes until you dig down to those layers that were deposited more than 120,000 years ago. Here, the carbon percentage falls abruptly by 50%, as does the percentage of pollen from fire-resistant plants such as eucalypts. In those lower layers the main pollen types represent older floral assemblies dominated by fire-sensitive relicts from cooler, wetter times, such as the casuarinas.(4) A warm interglacial period had begun around 125,000 years ago,(5) but this was associated with increased humidity, and fails to account for such a dramatic increase in the prevalence of fire in the relatively well-watered region around Lake George. The only other comparable jump in the carbon record coincides with European settlement in the area, when farmers began to clear the native vegetation to make way for pasture and cultivation.(6)

Similar carbon-pollen horizons have since shown up in two drill-cores taken from the continental shelf east of Townsville and Cairns. The carbon horizon in the northern core sample has been dated to 130,000 years, slightly older than the Lake George sample,(7) while an even older carbon-pollen horizon has recently been identified in a drill core pulled from the seabed off the Indonesian island of Lombok. This registered a securely dated carbon peak about 200,000 years ago that also coincides with the beginning of a major change from forest species to grass species in the island's pollen record.(8)

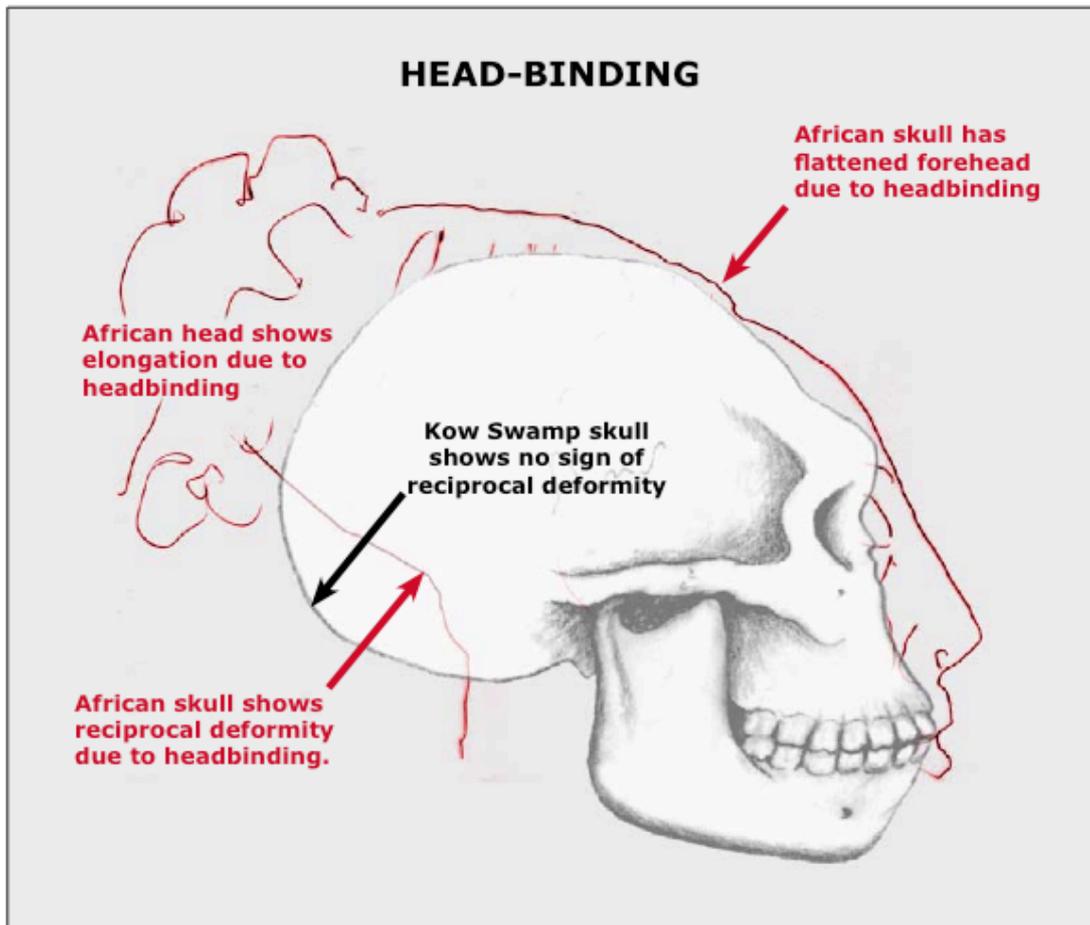
The simple explanation, indeed, the only satisfactory explanation for these well-defined, carbon-pollen horizons and their chronologically sequential southward march is that they signal the gradual advance of archaic hunter-gatherers armed with 'fire-farming' techniques, techniques that were eventually copied by fully modern human beings when they finally arrived in the area tens of thousands of years later. To deny the possibility that those archaic Australians were capable of using fire in this sophisticated fashion would seem to grossly underestimate them. Hearth stones and charred animal bones show that fire has been regularly used for warmth, protection

creatures, and they would have promptly set about resolving the problem with the lethal efficiency that is characteristic of our kind. Fierce territoriality is what works best for meat-eating mammals, and having a significant mental edge on their opponents, the 'home team' could not have lost.

If, on the other hand, the archaics were indeed the original occupants of the continent, they would have been pushed back into the less hospitable interior by the *Homo sapiens* invaders, just as most Aboriginal groups were pushed to less habitable areas by well-armed British colonists tens of thousands of years later. Cross-fertilisation occurred, but it was rare indeed. On the island of Tasmania for example, the Aboriginal population was entirely exterminated by a combination of guns, disease and legislation, leaving precious little genetic residue in the surviving European population.

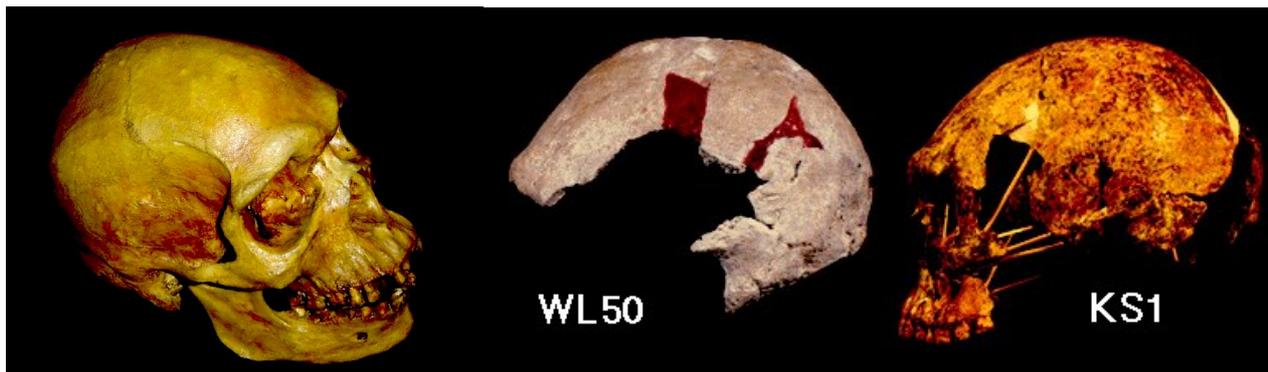
Considering the difficulty all modern humans seem to have in coexisting with others who differ merely in religion, language or skin colour, no explanation of the wide dispersal of the archaic skulls seems better than the simple one: the archaics were here first. Certainly the physical differences between the archaics and the later invaders would have been dramatic. The heavy-boned skulls of those first Australians place them outside the spectrum of modern human beings, and according to anthropologist Alan Thorne of the Australian National University, their skull architecture demonstrates a greater evolutionary distance from modern Aborigines than there is between modern Europeans and the Neanderthals of Ice Age Europe. **(11)**

A curious argument has recently arisen about this original assessment by Professor Thorne. A leading American authority has argued that the receding foreheads displayed by archaic Australian skulls are merely the result of head-binding. According to this widely accepted view, the skulls represent distorted fossils which, in certain other respects, might fall within the outer limits of *Homo sapiens* skull architecture. Nevertheless, many of Australia's archaic skulls show not the faintest sign of the reciprocal deformity that inevitably comes with head binding. The rule known as Ockham's Razor **(12)** should therefore apply, and we should accept the simpler alternative: that the skulls do indeed represent an archaic species of human being.



KOW SWAMP skulls show no sign of a reciprocal deformity.
 (Kow Swamp 1: cast courtesy of Dr. Alan Thorne, ANU, ACT)

If there was any cross-fertilisation—and judging by modern human behaviour there probably was—then it would have been largely the product of opportunistic rape or enslavement of archaics by raiding parties of *Homo sapiens*, and its genetic impact would have been relatively minor and would have produced little or no change in the morphology or behaviour of the conquerors. It would show up only in blood groupings, statistical DNA analysis and an occasional morphological ‘throw-back’, such as the very recent but atavistic skulls WLH 50 and Pintubi 1.



The very recent and exceptionally large skull WLH 50 from Willandra Lakes displays its close relationship to the Kow Swamp 1 skull on the right. This Willandra skull has been tentatively dated at somewhere around 100 years old.

(Photos courtesy of J. Vanhollebeke.)

The truly remarkable feature of the archaics’ presence in Australia, however, was their durability in the presence of modern humans. Underpinned by several methods of dating, the evidence of the archaic skulls shows that their lineage survived here far longer than anywhere else in the world—until about 9,000 years ago at one site in Victoria.⁽¹³⁾ It is also clear that their long residence in this uniquely infertile and inhospitable continent would have demanded a remarkable degree of adaptability and a high level of intelligence and social co-operation within tribal groups—all the more so when modern humans appeared on the scene. Add this to *Homo erectus*’ initial migration to Flores by sea 800,000 years ago, and you have an archaic species of astonishing capability—and an original Australian that warrants public recognition and considerable respect. But what became of them?

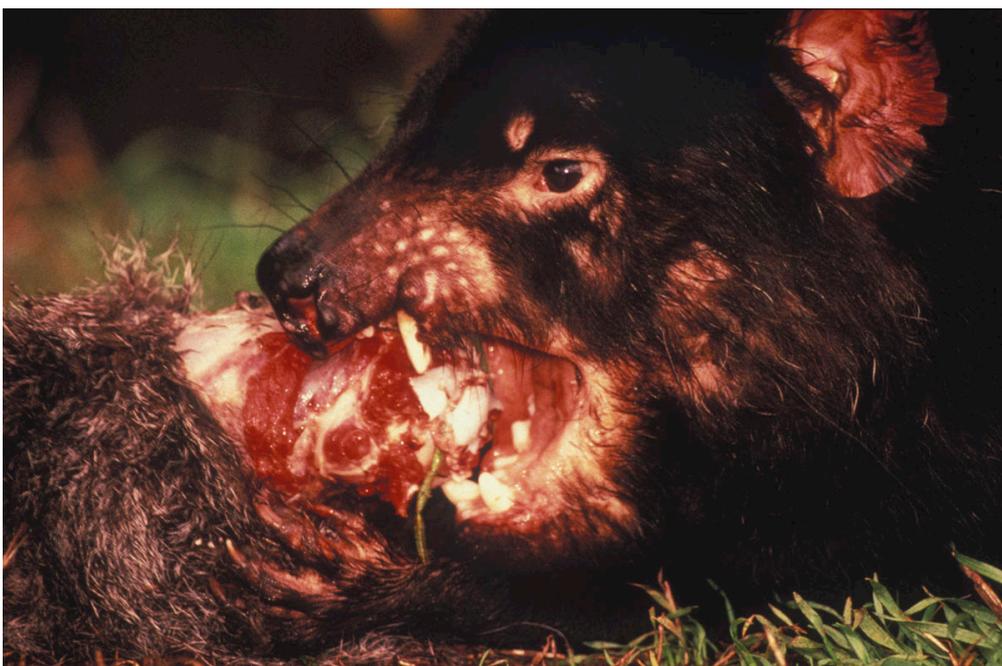
The body snatchers

Australia has always been unrewarding for fossil hunters. Most of it is old, arid and featureless, and as a consequence, very few bones become buried and preserved. But there is another reason why good fossils are relatively scarce here. The continent appears to have supported an unusually large

prehistoric population of aggressive scavengers, notably the Tasmanian Devil (*Sarcophilus harrisii*), and at least one gigantic lizard, *Megalania prisca*. These two alone would have ensured that remarkably few bodies were left intact long enough to become buried and preserved. Skeletal remains show that the lizard reached 7 metres (about 23 feet) in length and weighed up to 600kg (more than half a ton).⁽¹⁴⁾ That is about ten times the weight of its modern relative, the giant Komodo Dragon (*Varanus komodoensis*), which still roams the islands of Komodo and Lombok and is feared for its man-eating potential.



Komodo Dragon (*Varanus komodoensis*)



Tasmanian Devil (*Sarcophilus harrisii*).

The Tasmanian Devil on the other hand, is relatively small and, unlike the Komodo Dragon, is no threat to live humans. It is a dedicated scavenger, however, and eats the entire carcass, fur, flesh, skin, bones—the lot. It was common throughout Australia until the dingo was introduced some 4,500 years ago, and where the Devil still roams in Tasmania, there are few carcasses that lie around long enough to fossilise.

In short, the dearth of archaic skeletal material in Australia certainly does not mean that archaic humans were not present in significant numbers long before the ancestors of the Aborigines arrived.

Other signs of early human occupation, such as rock engravings and stone artefacts, are notoriously difficult to date, and although the whole continent is decorated with elaborate petroglyphs and littered with stone tools and stone-chip debris left by early hunters, all of this archaeological evidence is routinely assigned to Aboriginal culture. No doubt some of this material belonged to Australia's archaic first settlers, but until some means is found to distinguish those items from more recent material the enigma remains.



Grinding stones and stone-chip tools and core stones. Simpson Desert, NT.

A watershed has indeed been detected in the technique of stone-tool manufacture in Australia, but current dating suggests that this refinement in technology may have occurred only about 5,000 years ago. In other words it probably signifies a fresh influx of *H. sapiens* from Indonesia—perhaps the same wave of migrants that brought their dingo pets with them.



Some abstract engravings (LEFT) and ant-like Bradshaw figures (RIGHT) in central and north-western W.A. are thought to be 20,000 years old at the very least, and in a few cases, more than 30,000 years old. Modern Aborigines disclaim ownership of these designs and routinely assign their authorship to dreamtime spirits.



A shell midden, ~30,000 years old, beside Lake Mungo (background) in south-western New South Wales. Modern-human fossil material is stratigraphically associated with the shells which they would have gathered from the snow-fed lake during the onset of the last glacial episode. Some ritually buried skeletal remains in the area have been dated to more than 40,000 years old. They are the oldest remains of *Homo sapiens* in the southern hemisphere.

What finally sealed the fate of Australia's original *Homo erectus* inhabitants we may never know. Perhaps they failed to cope with the post-glacial climate change and the desertification of the continent; or perhaps they finally succumbed to attrition by the sharp-witted (*Homo sapiens*) ancestors of Australia's modern Aborigines. One thing is certain however, territorial competition between the two species would have escalated savagely as sea levels rose between 13,000 and 8,000 years ago, and no trace of Australia's original inhabitants remains thereafter.

As the ice age waned during this period and global warming melted the polar ice caps, the heat-swollen oceans gradually submerged the broad, flat shelves that fringed all the continents. Sea levels rose by more than 100 metres during this time and the Australian continent lost at least one seventh of its surface area in the process. All coastal populations of *Homo sapiens* would have been forced to establish new territories much further inland. Accustomed as they were to a comfortable life along the well-watered coastlines and extensive river systems of glacial Australia, most Aboriginal tribal groups would have been forced to encroach on territories traditionally claimed by their archaic neighbours. Where *H. sapiens'* territory adjoined land still occupied by their *H. erectus* predecessors, they would have dealt with them in the same aggressive way that European invaders would deal with their predecessors, the Aborigines, many thousands of years later. In this original species-displacement event however, there were no survivors. Apart from a few enigmatic skulls, it is as if *H. erectus* had never reached Australia.

When species disperse

Much has also been made of the recent proposition that our species, *Homo sapiens*, did not originate in Africa but evolved in many regions simultaneously from pre-existing populations of *H. erectus*. It is known as the Multiregional Hypothesis and pivots on a promiscuous genetic exchange, not only between closely related groups, but between archaic residents and modern newcomers. This high rate of genetic exchange is necessary to explain the extraordinary level of homogeneity in modern *Homo sapiens*.

By contrast, the evolutionary process essentially pivots on the tendency of species to genetically diversify and become reproductively isolated (speciate) when they disperse into alien environments. A better explanation for our

modern homogeneity is therefore provided by the Out-of-Africa model which proposes that modern humans are the undiversified progeny of a single, abrupt and very recent dispersal event. In short, Africa is where our species evolved and diverged from its *H. erectus* ancestor before dispersing to the wider world less than 100,000 years ago. Meanwhile, the persistence of a clearly identifiable archaic form in Australia until just 9,000 years ago means that these two species were competitive tenants of the continent for at least 40,000 with minimal genetic exchange and no loss of morphological identity.

The similar birthplace and radiation pattern of both species would have continually brought *Homo sapiens* into close contact with their *H. erectus* predecessors, and competition for prey and other resources would have led invariably to conflict. The tendency to aggressive territoriality and the frequent displacement of resident populations—or species—is an essential characteristic of predators. However, evolution should not be confused with 'Progress' and the confrontation between *erectus* and *sapiens* would not have been between an 'incompetent' archaic and a 'superior' newcomer. The newcomers may have been better equipped in a neuronal sense, but the *erectus* residents were well adapted, highly successful hunter-gatherers and they would have enjoyed a significant 'home-team advantage'. In other words, *H. erectus* would often have been very hard to dislodge or exterminate. Meanwhile, in those sparsely populated times, if you had trouble dislodging the traditional owners of one valley you didn't have to maintain a costly war of attrition, you could always move on to greener, more peaceful valleys beyond.

The real killer, however, would have been the looming ice age and the savage climatic instability that came with it. *Homo sapiens'* larger brain and greater behavioural flexibility would have made them more adaptable to the changing conditions while the shrinkage of territory and resources would have continually turned up the heat in all territorial conflicts, especially those that pitted *H. sapiens* against their *H. erectus* neighbours. In this fashion, climate change would have been the clinching factor in the ultimate disappearance of those first Australians.

The X-Factor

We cannot hope to discover precisely what prompted our *Homo erectus* ancestors to leave their African birthplace and migrate half way round the world almost two million years ago, or what prompted their descendants to migrate by sea to Flores and Australia. But since we still carry their genes in our bodies it is a fair guess that most of their genetic imperatives live on inside us, imperatives that drive modern human beings on journeys of similar magnitude—to the tops of mountains and the bottom of seas, into the invisible worlds of molecules and microbes, and deep into space in search of that ultimate frontier, our cosmic origin.

The attributes that enable us to do this are our unrivalled abilities to cooperate, to communicate, to fashion tools, and to imagine non-existent events and circumstances. But there is another, even more vital ingredient that we rarely identify as such; one that plays a crucial role in stimulating the first four and bonding them into a unique and powerful driving force. This fifth factor is our universal tendency to attribute extraordinary ‘significance’ to everything that either contributes to, or threatens, our genes’ ability to survive and reproduce.

Many mammals display an occasional trace of this mystical factor, and primates do it often (chimp genocides have been recorded). But this apeish talent for mysticism has, in our case, been honed by some two million years of Darwinian selection to the point where we might now be tempted to reclassify ourselves as obligate mystics and erect the taxonomic label *Homo mysticus* to replace *Homo sapiens*. Magnified by complex language, this peculiar talent for mysticism now supercharges almost all human endeavour, fashioning our friendships and hatreds, feeding our faiths, building nations and tearing them apart.

It provides the clever neurochemistry that allows us to disengage the rational brain to the point where we can pray to gods, fear devils, sacrifice our lives for a flag, and slaughter our neighbours at whim. In short, it allows us to believe passionately in the patently unbelievable—in ghosts, gods, angels, astrology, alien abductions, endless economic growth and Creationism. Our *Homo erectus* genes are still alive and well and very active in all of us

NOTES

1. Morewood, M.J., Sullivan, P.O., Aziz, F., and Raza, A. "Fission-track ages of stone tools."
2. The island of New Guinea represents the northern edge of the Australian continental raft and during periods of low sea level, such as 160-142,000 years ago and 20-15,000 years ago, it was linked to mainland Australia by broad fertile plains that now lie beneath the Arafura Sea and the Gulf of Carpentaria.
3. Thorne, Alan, Australian National University, Canberra. (Pers. comm. 1996).
4. White, Mary E. *After the Greening* (1994), pp.188-193. See also G. Singh and E.A. Geissler, "Late Cenozoic history of vegetation, fire, lake levels and climate at Lake George, New South Wales, Australia." *Philosophical Transactions of the Royal Society of London* 1985, 311: 379-447.
5. Frakes, L.A. *Climates Throughout Geological Time* (1979, 1980) p.249.
6. White, *After the Greening* (1994) pp.190-191.
7. Dayton, Leigh, and James Woodford, "Australia's Date with Destiny." *New Scientist*, 7 December (1996), pp.30-31. See also A.P. Kershaw, "Climatic change and Aboriginal burning in north-east Australia during the last two glacials." *Nature* 322 (1986) pp.47-49.
8. Kershaw, A.P., Moss, P.T., and van der Kaars, S. "Environmental change and the human occupation of Australia." *Anthropologie* 35/23 (1997) pp.35-43.
9. Harris, D.R., "Human diet and subsistence." *The Cambridge Encyclopedia of Human Evolution*, (1994), p.72.
10. Leakey, Richard E., and Lewin, Roger. *Origins* (1982) p.123.
11. Thorne (Pers. comm. 1996).
12. William of Ockham, a 14th century Franciscan friar, proposed the methodological guideline that still bears his name. In essence it states that, in enigmatic circumstances, explanations that require the least additional supposition should be preferred.
13. Thorne (Pers. comm. 1997).
14. Vickers-Rich, Patricia, and Rich, Thomas H. *Wildlife of Gondwana* (1993) p.197.