Mediaportal Report

01/03/2008

WALKING WITH HoBBrrs
Australasian Science, 01/03/08, General News, Page 16
By: Colin Groves

Clip Ref: **00034332160**
1215 words

Australasian Science
March, 2008
Page: 16
General News
Region: National Circulation: 9000
Type: Magazines Science / Technology
Size: 1125.81 sq.cms
Monthly

WALKING WITH HOBBITS

BY COLIN GROVES

The ancestors of the miniature hominins found on the Indonesian island of Flores may have spread out of Africa even before the ancestors of modern humans.

The fossil record of human evolution is extremely well-known, comparable to only a few other large mammals, such as elephants. Fifty years ago, specialists were speaking of a single main line of human evolution, progressing from *Australopithecus africanus* (small brain, short legs, prominent jaws) through *Homo erectus* to modern humans (*Homo sapiens*), with perhaps at most one or two sidelines.

Today it is clear that there is no "main line". At every stage there has been diversification, with new species arising and others becoming extinct. *Homo erectus* is itself a side-branch, confined to Java, and so probably is *Australopithecus africanus*. Altogether some 20 species of hominins – the name given to the human group since its separation from the ancestors of chimpanzees – are now recognised.

All hominins lived in Africa until about two million years ago, but since that time four or five different species have spread their ranges into Eurasia, some soon to be replaced but others persisting for a long period.

The earliest representatives of our own species, *Homo sapiens*, are known from Ethiopia, dated to nearly 200,000 years ago. Our species spread out of Africa 50–60,000 years ago, meeting and gradually replacing the Neanderthal people (*Homo neanderthalensis*) in the Middle East and Europe.

It may be that during their migration our ancestors also met and replaced the last remaining population of *Homo erectus* in Java. Some controversial dates at a site called Ngandong suggest that *Homo erectus* could have survived until about 30,000 years ago.

This picture was rudely shattered by the announcement in late 2004 of the discovery of a new species, *Homo floresiensis*, in Liang Bua, a cave on Flores in south-eastern Indonesia. The new species was based largely on LB1, the nearly complete skeleton of a tiny adult (about 1 metre high) with a tiny brain. Its cranial capacity was about 400 cc – much smaller than the 1200–1700 cc of most modern humans. Furthermore, LB1 was only 18,000 years old!

The discoverers – Peter Brown and Mike Morwood of the University of New England, along with colleagues at UNE and the Institute of Archaeology in Jakarta – considered it most likely to be a dwarfed descendant of *Homo erectus*, which had lived on Java only four islands to the west. They appealed to the well-established principle of "island dwarfing" – the idea that large mammals tend to become smaller in size on small islands.

A 2.4-million-year-old australopithecine from South Africa.

Naturally, a startling discovery like this at once became world famous. The writings of J. R. R. Tolkien are enduringly popular, and in particular the last film in Peter Jackson's *Lord of the Rings* trilogy had just been released. Scientists and journalists alike, apparently without any collusion, gave the new species its obvious nickname: the hobbit.

There was immediate controversy. Many commentators refused to believe that a hominin species with such extraordinary characteristics had existed so late in time – or, indeed, at all. Small in size: could it just be a pygmy, or suffering from a growth retardation condition? Small-brained: could it be suffering from a rare condition in modern humans called microcephaly?

The "deniers" have had more publicity than the quality of their arguments deserve. Their objections for a long time appeared only in newspapers and occasionally on TV, but in 2006 three papers by "deniers" finally appeared in the scientific literature.

The most detailed of these was a multi-authored paper led by the late Teuku Jacob, Indonesia's leading palaeoanthropologist, arguing that LB1 was a microcephalic dwarf that probably suffered from other pathological conditions too.

Australasian Science
March, 2008
Page: 16
General News
Region: National Circulation: 9000
Type: Magazines Science / Technology
Size: 1125.81 sq.cms
Monthly

A comparison of the skulls of *Homo habilis, Homo floresiensis* and *Homo erectus*

The long-awaited publication of these objections naturally fuelled the controversy in the public arena, and it was during this year that two hour-long films on the subject appeared on TV, one made by National Geographic, the other by the British Broadcasting Corporation.

But new evidence supporting the new species also appeared in 2006. Stone tools had been found in the deposits containing *Homo floresiensis*, and Adam Brumm and his colleagues at the Australian National University argued that they were hardly different from those previously discovered at an open site on Flores dating to 800,000 years ago – a long period with no change!

The second paper, by Debbie Argue of the ANU and colleagues collected all the evidence to date. They showed that the microcephalic hypothesis is untenable and, in agreement with a later reassessment by Morwood and his colleagues, found that the closest similarities of *Homo floresiensis* were with late australopithecines or primitive members of the genus *Homo,* such as *Homo habilis* and *Homo ergaster*, both of which lived in East Africa about 1.4–2 million years ago.

Last year ushered in the American contributions. Dean Falk of Florida State University and colleagues showed that LB1 is quite unlike any modern human microcephalic. Matthew Tocheri of the Smithsonian Institute and colleagues found that its carpal bones resemble those of australopithecines and *Homo habilis*. Susan Larson and her research group at Stony Brook University found that the shoulder girdle of *Homo floresiensis* is unlike that of modern humans but resembles that of the "Turkana boy", a near-complete skeleton of *Homo ergaster*, and those of australopithecines where these are known.

When all is said and done, the proposed pathological conditions relate almost entirely to LB1. The eight other individuals of *Homo floresiensis*, whose discovery was announced a year after the paper describing LB1, consist mostly of one or a few bones each, but they are entirely consistent with LB1. In fact, they are all slightly smaller! Importantly, one individual (LB6) is represented not only by some hand bones and a scapula, but also a mandible.

Moreover, the remains are scattered through the deposits from as much as 95,000 to as late as 12,000 years ago. Even had the proposed pathological conditions of LB1 any cogency, it beggars belief that, over a time span of more than 80,000 years, all of the individuals whose remains ended up in Liang Bua happened to be pathologically tiny!

The evidence has become undeniable: there are no microcephalics in Liang Bua. *Homo floresiensis* is a valid species. There really was a tiny near-human species living on Flores until 12,000 years ago.

But what we still do not know is whether *Homo sapiens* was there at the same time, and whether they met.

The Features of the Hobbit

Homo floresiensis was a species of very small size, with relatively short legs comparable to australopithecines. Features of the humerus, clavicle and scapula indicate less wide rotation ability at the shoulder. The wrist bones indicate a lack of the palmar expansion – which is associated with the specialised form of precision grip – found in modern humans. Where comparative parts are represented in earlier species, *Homo floresiensis* is like australopithecines (for which both wrist and shoulder are known), *Homo habilis* (in which only the wrist is known) and *Homo ergaster* (in which only the shoulder is known).

The brain was as tiny as an australopithecine (or indeed a chimpanzee). It had moderate-sized brow ridges, a retreating forehead, a small external ear opening like an australopithecine (unlike modern humans), protruding jaws, relatively large cheekteeth, and a retreating mandibular symphysis ("chin") with internal buttressing.

Let us for a moment look more closely at the mandible, since its morphology is very characteristic in different hominin species. Remember that the mandible in

Australasian Science
March, 2008
Page: 16
General News
Region: National Circulation: 9000
Type: Magazines Science / Technology
Size: 1125.81 sq.cms
Monthly

Homo floresiensis is represented by two individuals, LB1 and LB6, so its form is not just an oddity in a single specimen.

In modern humans the symphysis – where the two halves of the lower jaw meet in the midline – is famously pulled forward at its lower margin to form a chin. A thin ridge runs down the front of the symphysis and joins a thicker ridge running along the lower margin to form an upside-down T. All modern human mandibles, without exception as far as is known, have this structure, whether the actual chin is prominent and pointed or receding.

In early hominins (*Australopithecus*, *Homo habilis*) the symphysis recedes markedly, and there is never a trace of a chin protrusion or of the upside-down T structure. But inside – on the back of the symphysis – there are two shelf-like buttresses of bone, the superior and inferior transverse torus, separated by a fossa where the tongue muscles attach. (*Homo ergaster*, *Homo erectus* and other intermediate-age species have less receding symphyses and smaller transverse tori, and there is sometimes a trace of the upside-down T structure).

But in LB1 and LB6 we see no trace of the modern human structure. Instead we see massive internal buttressing like australopithecines or *Homo habilis*.

Where did it come from, this hobbit? Was it, as the original description suggested, descended from *Homo erectus*, best known from sites in Java dated to around the Early/Middle Pleistocene boundary?

Almost certainly not. The brain is much too small for it to be a dwarf *Homo erectus*, and in general it seems far too primitive.

The best explanation is that it is a direct descendant of *Homo habilis*, or even a late australopithecine, which spread its range outside Africa even before the ancestors of *Homo erectus* did.

The question is: can we find traces of its passage? There are almost no fossils of the relevant time period anywhere between Africa and Java, but in Java itself there are (mostly rather scrappy) remains from levels somewhat earlier than those from which *Homo erectus* have come. Most authors have considered that these early Javanese fossils also represent *Homo erectus*, but recently a joint Japanese and Indonesian team, led by the noted palaeoanthropologist Kaifu, have found that they are actually rather different.

This raises a question: if there is something different, something non-*erectus*, in these early levels, could *Homo floresiensis* have a hitherto unrecognised ancestor among them?

Postscript

The unfriendly reception accorded to *Homo floresiensis* is just the latest phase in a long and inglorious tradition of raspberries directed at new and important discoveries of hominin fossils. The Neanderthal skull, the first specimen of *Homo erectus*, the first skull of *Australopithecus africanus*, and the description of *Homo habilis* – all these pivotal specimens were greeted with scornful, patronising, often openly rude comments, and ironically many of the detractors interpreted them as mere pathologies! This tradition may be inglorious, but it is certainly time-honoured.

Colin Groves is Professor of Archaeology and Anthropology at the Australian National University.


WALKING WITH HOBBITS

Australasian Science
March, 2008
Page: 16
General News
Region: National Circulation: 9000
Type: Magazines Science / Technology
Size: 1125.81 sq.cms
Monthly

Meganthropus palaeojavanicus **is one of the earliest fossils from Java, and a possible ancestor of the Hobbit.**

A *Homo erectus* skull from Java compared with the African *Homo heidelbergensis*, a direct ancestor to both modern humans and Neandertals.