

The Amazing Shrinking Humans from Flores

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This article considers the discovery of the bones of little people on the island of Flores. Popularly known as 'hobbits', they have caught the imagination of the world. That they ever existed is both surprising and instructive.

We have grown accustomed to hominid fossils being announced with a fanfare of publicity, hailed as bringing a dramatic new understanding of the evolution of our species. However, with the passing of time, these finds seem not so important after all, and seasoned observers realise that there are other agendas at work driving the media interest. Nevertheless, on 28th October 2004, something genuinely novel appeared in the pages of *Nature* (Brown *et al*, 2004) and hit the front pages of newspapers around the world. Professor Chris Stringer commented (2004): "When a new fossil is found it is often claimed that it will rewrite the anthropological textbooks. But in the case of an astonishing new discovery from Indonesia, this claim is fully justified". It was a diminutive skeleton that appeared very human-like but with a brain size comparable to the smallest known australopithecine. This was big news because everyone – both creationists and evolutionists – had previously considered human brain sizes to be significantly larger than any of the apes.

Enter *Homo floresiensis*

The main skeleton is known as LB1, found during an archaeological excavation in a cave at Liang Bua on the island of Flores. The bones are not fossilised and are in a very fragile condition. Dating procedures have assigned an age in the range 38,000-18,000 years before the present (Morwood *et al*, 2004). They are therefore 'young' from the perspective of the hominid evolutionary story, and contemporaneous with modern man, *Homo sapiens*. The cranium and mandible of LB1 are well preserved, and there are numerous other bones to study. There are thought to be eight separate individuals that have been discovered, but excavations have looked at only a small area to date (Wong, 2004). The bones are all small, but the most startling discovery is that the size of the human-like brain is only about 400 cm³.

For a human to have such a small brain was totally unexpected. Peter Brown, co-author and palaeoanthropologist at the University of New England in Armidale, Australia, said: "My jaw dropped to my knees" (Dalton, 2004). Chris Stringer (2004), of the Natural History Museum in London, wrote: "When I then heard rumours about the discovery of an early human skeleton in a cave on Flores, I was ready to be surprised. However, nothing could have prepared me for how big (or small) that surprise would be". Leslie Aiello, of University College London, is reported as saying, "If they are correct, this really is a stunner" (Balter, 2005). Fred Spoor, also of University College London, commented that the new study "upsets one of our main concepts of human evolution, that our brain size has to increase for humans to become clever" (Balter, 2005).

The archaeological research has identified an association of hominid bones with the bones of young dwarfed *Stegodon*, a Komodo dragon, very large rodents, bats, birds and fish. Some of these bones are charred, suggesting that they had been cooked in a fire. There are stone tools and cut marks on the bones. The ancestors of these hominids must have been capable of building boats and setting out to cross the straits between islands along the Malay Archipelago. Since there are no evidences of alternative agents to perform these advanced tasks, the researchers have made a design inference and concluded that these little hominids were responsible. This suggests that

they were intelligent, resourceful and capable of communicating using language. Their discoverers have dubbed them 'hobbits' and this nickname has been adopted widely.

Was LB1 a pathological microcephalic?

Soon after the main story broke, the Indonesian palaeoanthropologist Teuku Jacob was promoting his view that the bones were the remains of humans afflicted with microcephaly (Balter, 2004). Jacob was not a lone voice: two Australian specialists were advancing the same idea. This analysis did not gain much of a following. Stringer is reported as saying that, while sufferers of microcephaly have small brain cases, their jaws, chins and pelvis bones are of normal dimensions (Aglionby and McKie, 2004). "Everything that was found of *Homo floresiensis* was diminutive, so I don't see how you can substantiate the claim that these were modern little people with one particular condition. Also, the chin is that of a very primitive hominid, not a modern human. I firmly believe Brown has made a superb discovery on Flores".

Nevertheless, the microcephaly explanation was publicised positively by Wieland (2004). Many creationists came to interpret the data in this way so that *Homo floresiensis* provides an example of degeneration (rather than evolution). More recent work has, however, indicated that microcephaly is unlikely to be the key for understanding the hobbits. Morwood and Brown had the LB1 skull scanned at a hospital in Jakarta and collaborated in the analysis of data with Dean Falk and colleagues in the US. These researchers created an image of the endocast of the brain (which preserves its surface features). This was then compared with virtual endocasts obtained from the skulls of a modern human, a pygmy, a microcephalic modern human, a *Homo erectus* and a chimpanzee. Their findings (Falk *et al*, 2005) led them to discount microcephaly: "Unless a *H. erectus*-like endocast shape is characteristic of an unrecognised form of secondary microcephaly, we reject the hypothesis that LB1 was a pathological microcephalic." This qualification must be taken seriously, for we are not yet at the stage where secondary microcephaly can be ruled out completely. However, the onus now is on the advocates of this alternative view to present some data in support of their position.

Various characteristics of the endocast shape were identified that were considered significant. Balter

(2005) summarised the findings in this way:

“They found that, relative to its overall size, the brain of *Homo floresiensis* has very large temporal lobes, brain regions associated in living people with understanding speech and hearing. Even more dramatically, the hominid has highly folded and convoluted frontal lobes, areas of the brain just under the forehead that are implicated in higher cognition...The most convoluted region is in the most forward-projecting part of the frontal lobe, called the frontal pole. Falk identifies this region as Brodmann’s area 10, which is expanded in modern humans and is involved in undertaking initiatives and planning future actions – key components of higher cognition. This enlarged area suggests that the little Flores people may well have been capable of creating the stone tools that were found near them, which are more typical of those made by prehistoric modern humans than earlier hominids including *Homo erectus*.”

Whilst the endocast of LB1 is considered uniquely different from all the other endocasts studied, it was closest to that of *Homo erectus*. Falk *et al* (2005) offer two scenarios for this. The first involves endemic dwarfing of *Homo erectus* ancestors and the second option is that *H. erectus* and *H. floresiensis* shared a diminutive unknown ancestor.

“Although it is possible that *H. floresiensis* represented an endemic island dwarf that, over time, became subject to unusual allometric constraints, an alternative hypothesis is that *H. erectus* and *H. floresiensis* may have shared a common ancestor that was an unknown small-bodied and small-brained hominin.”

The original paper by Brown *et al* (2004) considered several ways of explaining the small stature and brain size of LB1. They did not favour IGF-related postnatal growth retardation, nor pituitary dwarfism, nor primordial microcephalic dwarfism. Instead, insular dwarfing was suggested to be the “strongest candidate” for explaining the skeletal features. This is the phenomenon to which we now turn.

Island dwarfs

It is a curious fact that dwarf versions of many large animals are to be found on islands. The phenomenon is referred to as ‘insular dwarfing’ or ‘endemic dwarfing’. Foster (1964) proposed an “island rule” in which mammals larger than a rabbit reduced their body size and smaller mammals increased their size. The most striking examples concern elephants. Roth (2001) summarises the situation thus: “The island forms may be half or even one-quarter the shoulder heights of their mainland ancestors, with body mass reduced to just one or a few percent of the original (Roth 1990).”

Roth considers three possible mechanisms: phenotypic plasticity (e.g. stunting), genetic drift and genetic divergence under the influence of natural selection. Regarding the first mechanism, he considers the size differences to be too great to be achieved by stunting alone. Regarding the second, the trajectory of change (of elephants) is consistently towards smaller size, so genetic drift can be rejected. Consequently, he infers “natural selection must have been involved”.

Insular dwarfing has become one of the classic ‘just-so stories’ of Darwinism. Limited food resources on islands mean that the large herbivores present compete for very scarce resources and this leads to nutritional stunting. Natural selection favours those animals with a smaller body size and, with the passing of many generations, dwarf species emerge. The California Channel

Islands (US) are thought to provide a clear example in the case of a mammoth (Dudley, 1999):

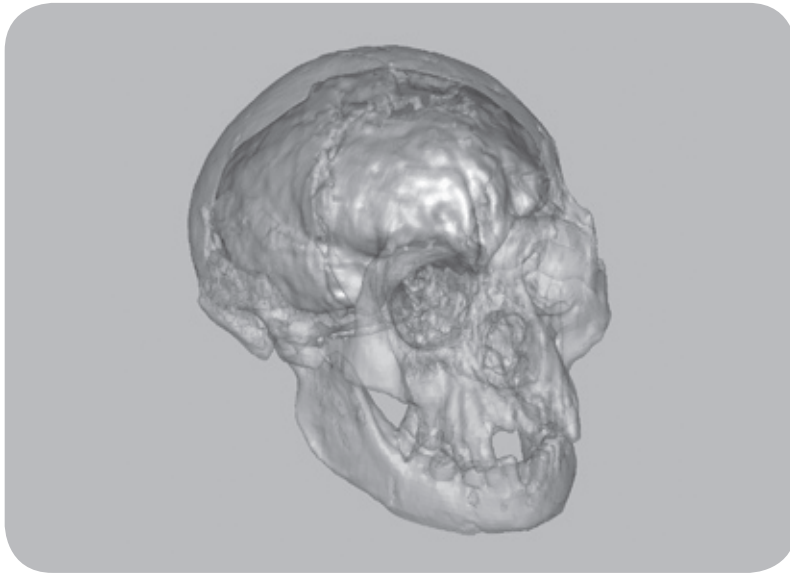
“The extreme genetic dwarfing of *Mammuthus exilis* (adult body mass 200-500 kg versus 5,000-10,000 kg for ancestral *Mammuthus columbi* populations) implies that forage availability was a limiting resource and suggests that all accessible palatable vegetation would have been heavily utilized...nutritional stunting occurred concurrently with, and favoured selection for, the evolution of smaller body size in this population”.

The hominids of Flores were omnivores, not herbivores, because we know they hunted and ate animals. Could insular dwarfing be relevant to their case? Brown *et al* (2004) consider that the answer is ‘yes’.

“Explanations of the island rule have primarily focused on resource availability, reduced levels of interspecific competition within relatively impoverished faunal communities and absence of predators. It has been argued that, in the absence of agriculture, tropical rainforests offer a very limited supply of calories for hominins. Under these conditions selection should favour the reduced energy requirements of smaller individuals. Although the details of the Pleistocene palaeoenvironments on Flores are still being documented, it is clear that until the arrival of mesolithic humans, the faunal suit was relatively impoverished, and the only large predators were the Komodo dragon and another large varanid. Dwarfing in LB1 may have been the end product of selection for small body size in a low calorific environment, either after isolation on Flores, or another insular environment in southeastern Asia.”

The problem with the Darwinian explanation of insular dwarfing is that it mostly relies on a good imagination. Evidence of stunting and selection pressures is lacking. Furthermore, dwarfing seems to be a one-way process and pygmy forms are considered to be in a state of stasis for thousands of years. Why is it that variability should be so constrained? In a situation like this, other causes of the phenomenon should be investigated and there should be a process of testing multiple hypotheses.

Mammalian faunas in North America are known to change at the Paleocene-Eocene transition. Gingerich (2003) has considered the rich fossil record and highlighted a phase of transient dwarfing. The reductions in size were, in these cases, not linked to restricted food supply on islands. Gingerich considers that this is a clear case of mammalian



The skull of *Homo floresiensis* (the LB1 specimen) with the brain endocast superimposed. The frontal lobe and the temporal lobes at the sides and at the back of the brain are not those of a microcephalic. These features are most closely related to *Homo erectus*. © Kirk Smith, Mallinckrodt Institute of Radiology. Used with permission.

responses to climatic change: “Elevated temperature and elevated CO₂ are both possible forcing factors” (p.471). Here is a hypothesis regarding dwarfing that is not linked to selection pressures acting on mammals experiencing constraints on food supply.

Stuart (1998) has documented evidence for a global iodine deficiency which adversely affects many different animals. He provides evidence that the world now hovers on the edge of deficiency and suggests that the Flood removed iodine from the environment. The most serious disorder in humans is cretinism, but the same cause can also lead to dwarfing.

It should also be noted that, whereas evolutionary theory supplies the paradigm (or conceptual framework) for most published studies dealing with life’s origins, other paradigms can be identified. Those Christians who understand the early chapters of Genesis to be history have been exploring issues relating to biological and geological science. Based on the way different ‘kinds’ were created and later preserved on the Ark, it can be concluded that there are major implications. There is a growing literature base on Basic Type biology and the closely related Baraminology. Although most Basic Type research has concerned living organisms, attention has been given to fossil hominids by Hartwig-Scherer (1998). This article covers much ground – the Cercopithecinae, the Hylobatidae, the Ponginae, the Gorillinae and the Homininae as extant Basic Types and the Australopithecines as an extinct Basic Type. The various fossil hominids are discussed within the Basic Type conceptual framework. This approach informed an overview of fossil man by Tyler (2000). Basically, within the human Basic Type can be located the various *Homo* species, including *Homo erectus*, *Homo sapiens neanderthalensis* and *Homo sapiens*. Whether *Homo floresiensis* is descended from *Homo erectus* or from *Homo sapiens*, its status is still that of a member of the Homininae. All of the members are united by common ancestry to Adam and Eve.

The phenomenon of dwarfing (whether insular or not) deserves much more attention by creation-oriented biologists. In addition to the issues raised above, there are many indications of rapid diversification of many Basic Types post-

Flood. One of these was discussed in some detail by Garner (1998): the fossil record of horses. The mechanisms responsible for such changes are under investigation, and it would be very surprising if they were not also relevant to dwarfing.

Man is made in the image of God – but which ‘Man’?

The Flores ‘hobbits’ have stimulated questions about how we as people perceive ourselves. Perhaps we are not so unique? Is our sense that humans are ‘special’ justified? Two examples are reproduced below.

Henry Gee (2004) expressed the question succinctly when he wrote:

“If it turns out that the diversity of human beings was always high, remained high until very recently and might not be entirely extinguished, we are entitled to question the security of some of our deepest beliefs. Will the real image of God please stand up?”

Desmond Morris (2004) expressed the view that religious people will be theologically challenged by the new discoveries:

“His very existence among us would make us question all over again what it is to be human. We are not used to this because our ancestors successfully killed off all our close relatives. This has created a chasm between us and the other animals, a chasm so big that religion went as far as to say that we are not even related to them. Humans have souls and they do not. Darwin put a stop to this nonsense with his theory of evolution, but amazingly the blindingly obvious truth he discovered is still resisted by large sections of the human population. They stubbornly continue to insist that we are some kind of special creation. The arrival of ‘Mini-Man’ is going to give them nightmares. [...] In theory, the existence of Mini-Man should destroy religion, but I can already hear the fanatics claiming that he has been put on earth by the Devil simply to test our faith.”

Various interpretations have been advanced by creationists: Mini-Man is an extinct human pygmy race, an australopithecine species, or humans afflicted with secondary microcephaly. But what if *H. floresiensis* is *H. erectus* affected by insular dwarfism? This happens to be my own view, although I am open to revising it if it can be falsified. What are the implications? Can the questions of Gee and Morris be answered if this understanding is correct?

History shows that people often put the boundary between 'Man' and 'not-Man' in the wrong place. Darwin allowed himself to entertain views that today would be regarded as racist. Hitler and the Nazi leaders were prepared to exterminate some racial groups in the interests of favouring the Aryan race. In the 19th century, the Tasmanians were treated worse than animals because they were excluded by the line of humanity that was drawn by white settlers. The quotations above (by Gee and Morris) presuppose that the line must be drawn between *Homo sapiens* and all other *Homo* species. However, what is the rationale for doing this? If all *Homo* species are human, as indicated by Basic Type biology, then we need to embrace them all as descendants of our first parents. The cultural traits of *H. sapiens neanderthalensis*, *H. erectus* and *H. floresiensis* are sufficient indication that here are humans living under pressure in a world that was still recovering from the destruction of the Flood. This is a major difference between creationists and theistic evolutionists, as the latter tend to draw the line between Old and New Stone Age Man. Many theistic evolutionists accept only Neolithic Man as descendants of Adam, leaving great question marks over the human cultural traits of Old Stone Age Man. The key to answering hard questions is to make sure our thinking is rooted in biblical revelation. If the foundations are solid, then we can be confident that satisfying answers will emerge.

“The Flores 'hobbits' have stimulated questions about how we as people perceive ourselves.”

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