

# Easter Island Stone Heads - A New Theory on Their Burial

or

The Cave-Excavate Theory on Why Many of the Stone Statues of Torsos (Moai) on the Slopes of the Volcano, Rano Raraku on Easter Island (Rapa Nui), are Half-buried, and, by Extension, the Theory that the Stone Tools (Toki) that were Found in the Backfill from Around the Moai, were Used as Picks for Digging Caves, and Not Hammers for Carving Moai.

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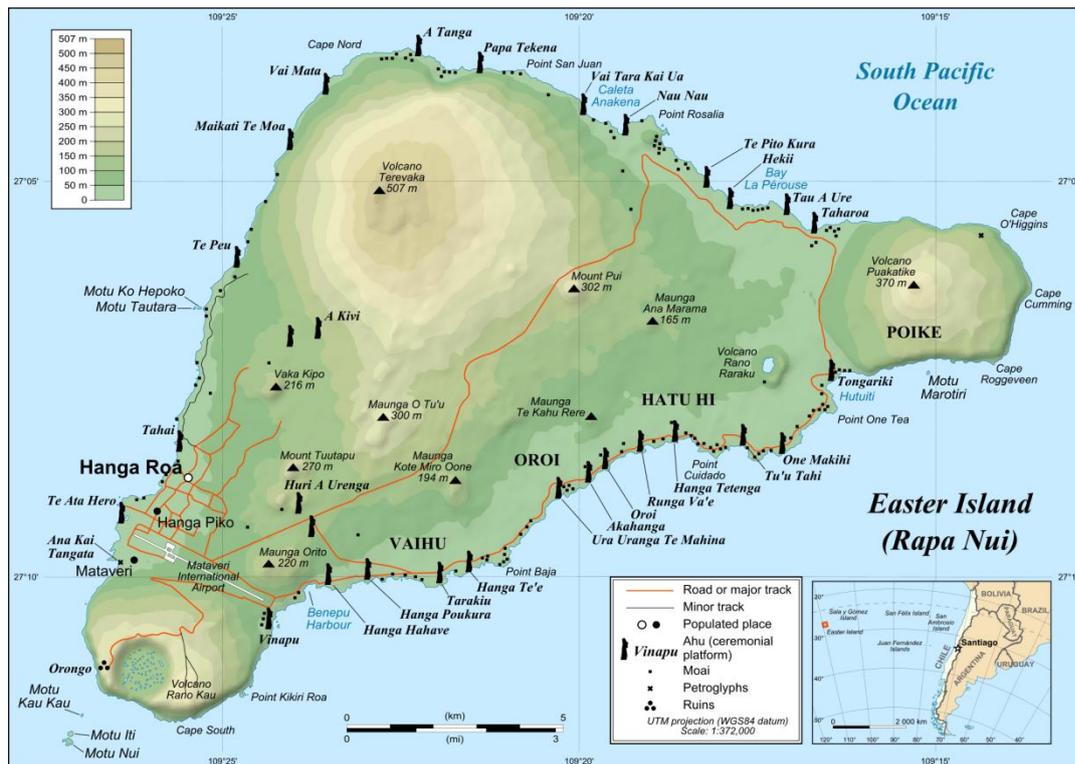


Fig. 1. Map of Easter Island showing the positioning of the almost 900 moai around the island. There is a concentration of half-buried moai on the southern slopes of the volcano Rano Raraku, towards the east of the Island, that is the subject of this paper, shown in the following image overleaf.

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## 1. INTRODUCTION / ABSTRACT / EXECUTIVE SUMMARY

Easter Island remains as mysterious today as when, on Easter Sunday 1722, a Dutch Captain, Jacob Roggeveen, landed his ship on the small Pacific island of Rapa Nui, and arrogantly renamed it Easter Island. The almost 900 enigmatic stone statues of stylized torsos (moai) that were found have been the subject of wild speculation ever since. Moai are often referred to as 'The Easter Island Stone Heads' because many reports and pictures showed only the head protruding from the ground.

There is no extant record of who made them, why they were made, nor when, so the evidence that we do have of their history is circumstantial. Many statues have been placed on stone platforms (ahu) around the Island. There are also upright statues on the slopes of an extinct volcano, Rano Raraku, that are buried up to their necks. Upon excavation it is discovered that the moai are full torsos down to the waist, that the backfill is an evenly consistent soil of varying particle size (regolith) in which stone tools (toki) are randomly found, and that even the half-buried moai are placed onto platforms<sub>1</sub>.

There is a mystery as to how this could have happened. Is the backfill around the moai natural, or was it placed there? And if it was done by people, then why? Was it on purpose, to bury the moai or was the burial of the moai a by-product of another endeavor altogether? This paper argues that the accepted academic explanation for the burial of the moai, of "erosion caused by deforestation", is inaccurate for a number of reasons, and proposes that all this backfill material spread across the southern slope of Rano Raraku, was excavated from underground in an extensive cave construction operation, and tipped around the moai by the basketful, and that this is the reason why the landscape is mounded, why some of the moai lean forward, and why toki are found in the backfill.  
(324 of 3852 words)



Fig. 2. A few of the half-buried moai on the southern slopes of Rano Raraku, showing the mounded terrain, and showing that this landscape is without erosional features. This image also illustrates that the moai are mostly upright, and that a few are leaning forward.

## 2. THOR HEYERDAHL

In the 1950s Norwegian explorer Thor Heyerdahl, of Kontiki Expedition fame, visited Easter Island with a team of researchers to “solve the mysteries of Easter Island”. He published his findings in *Aku-Aku – The Secret of Easter Island*, in 1957<sup>2</sup>. This is a fascinating book with valuable historical, anthropological information. Heyerdahl interviewed a number of the locals about their artefacts and traditions and, having gained their trust over many months, was tentatively introduced to their cave system of family hideaways. He discovered that the more influential families have secret caves that are handed down the generations to the most trustworthy offspring, in which they would secrete their family from the ravages of the periodic slave trading and warring ships that would appear on their horizon. Heyerdahl relates stories of squeezing through perilous passageways of finely dressed stone, similar to Incan walls, in order to enter some of the caves. On page 66 of *Aku-Aku* he says, “...the shaft always had neat walls, often of skillfully cut blocks.” By the similarities of Incan walls in Peru and these walls on Easter Island, the construction would most likely have been undertaken during the same era with the same technology. Modern humans do not dress stone as well as this, which leads one to hypothesize that caves have been constructed on Easter Island for thousands of years, using an ancient rock-melting technology to facilitate the almost seamless jointing.

On page 71 of *Aku-Aku* Heyerdahl reports that they “... found an immense number of caves.” And, “These giant refuge caves could have accommodated the whole population of Easter Island.” (Estimated to be about 2500 people in 1956.) Other researchers have since found many more caves on Easter Island and there are You Tube videos available of their exploration. They are said to be natural, possibly because their discoverers could not conceive of the mining operation that would have had to have taken place if they were artificial.



Fig. 3. This is a photograph that was taken in 1955/6 during Thor Heyerdahl's archaeological expedition of Easter Island. He unearthed two statues, and more have been excavated since, all of which have been statues of entire torsos, down to the waist, and most, if not all of them, found to be standing on a stone platform.

Heyerdahl excavated the soil from around two of the buried upright statues and discovered that they are not only heads but entire torsos down to the waist, and what is more, they were placed onto stone platforms (ahu). With the help of the locals, he managed to move and raise a statue, proving that it is possible to do so by hand, with only poles and ropes. He found unfinished moai, half-carved out of bedrock, and he experimented with the stone tools (toki) he found. His team did manage to make some impression on an unfinished statue with these hand tools.

The statues that have been excavated by various researchers over the years have been found to be full torsos down to the waist, and as all the unburied statues on the island are full torsos, it is not unreasonable to assume, therefore, that all the buried moai on this slope have full torsos as well. This means that there is a layer of carefully-placed backfill of almost five metres thick over the entire slope of Rano Raraku. It was obviously carefully placed because only a few of the statues are leaning forward, and this can only be from settlement as the backfill was slowly placed around it, and not inundation by a flood or a mudslide.

### 3. ARCHAEOLOGICAL RESEARCH

One of the only researchers in recent times to have studied Easter Island in depth is Jo Anne Van Tilburg. She has, since the 1980s, seemed to have had a monopoly on research on Easter Island, and she continues to run the Easter Island Statue Project to this day<sup>1</sup>. She is an eminent academic, so her findings, one can only presume, reflect the state of scientific knowledge about the moai of Rapa Nui. She invokes the 'associated artefacts' principle to explain the relationship between the toki and the moai. Anthropology and archaeology often assume that if an artefact is found in association with a feature, that they are related: that is, that because the toki were found in the excavated material from around the moai, that the moai were carved with these same stone tools. This is an assumption and not necessarily the case. In fact, it is counter-intuitive to imagine that the same tools used to make the moai would be found in the material used to backfill around the upright moai in their positions away from the quarry.

Van Tilburg further tells us that Easter Island was previously forested, and that the inhabitants used up all of the trees moving the moai. This, she asserts, without quoting a geologist or a botanist, caused rampant erosion, bringing the soil down the slope to fill in around the moai that are now half-buried, and, she continues to assume, bringing social decline to the population and the end of the statue-building era. This 'erosion from deforestation' hypothesis makes no sense for at least six reasons, detailed in the following chapter. This hypothesis cannot explain why toki are found randomly in the 'sediment' excavated from around the moai, nor why the landscape is mounded, and, nor can it explain why none of the features typical of a landscape formed by erosion are evident in this landscape. One would imagine that in order for the resident academic to claim that the landscape has been formed by erosion, at least one erosional feature would be evident. I do not see one feature in this landscape that could have been formed by erosion.

Van Tilburg is very proud of the fact that she uses only locals on her project. This presumably means that any foreigners with any questions need not apply for any jobs digging any holes on Easter Island.



Fig. 4. An archaeological dig of the Easter Island Statue Project, overseen by Jo Anne Van Tilburg, where stone tools (toki) (See Fig. 5) are occasionally found in the material excavated from around the statues (moai). It can be seen that the soil is an even regolith without evidence of stratification or depositional horizons, and that the landscape is evenly mounded without any erosional features.



Fig. 5. Stone tools, called toki on Easter Island, have been found in association with the moai and with the backfill material excavated from around the moai. The fact that these tools, found discarded in the backfill, are mostly still fairly sharp, indicates that they are more likely to have been used as picks in soil than as hammers on stone.

#### 4. EROSION IS CLEARLY NOT THE ANSWER FOR SIX GOOD REASONS

The official, 'scientific', and commonly accepted explanation of "erosion due to deforestation", as to why many of the Easter Island stone torsos of Rano Raraku are half-buried, does not explain why the fill material contains toki, nor why the landscape is mounded. There is no evidence of slumping or dune formation on these slopes, nor are there the gullies and alluvial fans that are evidence of erosion from pluvial weathering. To this professional arborist and amateur geologist, nothing about the slopes of Rano Raraku indicate an erosional landscape, and this is proven by each of the following six reasons:

Firstly, the lack of trees on Rapa Nui, or even "rampant deforestation", are no reasons to assume that the soil would erode. As a tree was used by the statue builders, or anyone else, it would, within a season, have been replaced by ruderal grasses and other species which have more tightly-knitted root systems, and hold the soil even better than do tree roots. Even if they clear-felled forests to move the moai, the soil would have been exposed to erosion for less than a year before the ground was covered by ruderal plants, and certainly not long enough to be eroded very much. And, if the roots were not disturbed when the trees were cut down, and there is no reason to do so, and every reason not to, then the decaying roots would have provided stability to the soil against erosion and nutrients for the emergent ground-covers. (And, what is more, ruderal plant species are generally more productive than trees, so removing the trees could have even increased the carrying capacity of Easter Island and certainly not necessarily brought on social decline. More logical reasons than Van Tilburg's hypothesis of "erosion caused by deforestation" for social decline, are: slaving; wars; disease; and the introduction of pests such as insects or rats to the Island). Deforestation is no reason to assume any erosion of the soil.

Secondly, the limited area and exposed conditions on the slopes above the moai on Rano Raraku could not have sustained a forest suitable for poles, so logging operations on Easter Island would most likely not have affected the slopes above these particular moai. Also, the statues were carved from the bedrock of these slopes so the topsoil would have had to have been removed before the moai were carved, so there would have been insufficient soil left on the slope to have sustained a forest.

Thirdly, neither wind, nor rain, nor slumping, nor a tidal wave, could possibly place soil in mounds on a slope. Erosion washes soil down a slope and into a basin, and cannot deposit material on a slope. A landscape formed by erosion is characterised by gullies on the slopes and alluvial fans in the basins, and neither of these features are evident in the mounded landscape of the slopes of Rano Raraku. If the backfill around the statues had been from a tidal wave or from slumping of the soil in a mudslide, then all of the statues, balancing on stone platforms, would have been pushed over. As it is, the few leaning moai are evidence of a gradual settling and not a sudden inundation.

Fourthly, pluvial erosion leaves distinct horizons in the deposited sediment and a grade of particle sizes, and toki, being larger particles, would have settled out of the wash first, along with other particles of similar size. From what I can see from photographs of the walls of the excavations, there is no stratification, the backfill material is an even regolith, and there are no depositional horizons, or lenses, which are the hallmarks of sedimentation. Nothing indicates that the backfill around the moai is pluvial.

Fifthly, there is not the catchment area above this slope on Rano Raraku to have held the amount of soil that is evident around the moai. The entire southern slope of Rano Raraku is covered in an almost five-metre-thick layer of backfill that represents an enormous amount of soil, and there is no space above this area, on the side of the volcano, to have held this amount of soil. Also, the moai

were carved from this rock only after it was exposed, so the soil to backfill around the moai cannot have originated from the slopes where the moai were carved, unless the soil was moved twice, and even if there were enough soil, that would be highly unlikely.

And sixthly, the patently manufactured toki, artificial in origin, would not be found deposited randomly in a naturally eroded sediment, as they are in the backfill material around the moai. This fact alone means that the backfill material is not a naturally eroded or deposited sediment, and cannot have been placed around the moai by natural sedimentation, including erosion and volcanism.

It is clear that for each of the above six reasons the “erosion caused by deforestation” hypothesis cannot be the explanation for the burial of the moai. Whether Van Tilburg is lying about this or simply confused, remains to be seen. She could have jumped to her ‘erosion’ conclusion without consulting a botanist or a geologist, and it could be a naïve mistake, but arguably inexcusable for a publishing academic at the forefront of science, purporting to hold up the banner of objective enquiry. No geologist will be able to explain how pluvial erosion can deposit a mounded landscape on a slope, and no botanist who has seen the profusion of ruderal emergents after a forest is clear-felled, will support the ‘erosion caused by deforestation’ hypothesis. One reason for this lack of research and shoddy conclusion, is that it is not naïve at all, it could have been done on purpose, to hide something. It is because the evidence is so blatant that we must assume that Van Tilburg, willingly or unwillingly, is complicit in a conspiracy to keep something secret.

## 5. VOLCANISM

Volcanic ash can deposit on a slope, but it should be easy enough to determine if a regolith is volcanic in origin or not. The last eruption on Rapa Nui was apparently more than 250 000 years ago, so if it is volcanic ash that has half-buried the moai, then someone must have carved the moai more than a quarter of a million years ago. This is unlikely because the sea level is likely to have been vastly different 250 000 years ago, and the platforms around the Island are on the coast, meaning that the sea level hasn’t risen or dropped much since the moai were placed.

Even if some of the backfill around the statues can be shown to be volcanic debris, discarded toki could not have naturally been included, so the soils where the toki are found are certainly not volcanic. And, it seems from the record of when they are found during the course of a dig, that the toki are spread fairly evenly throughout the backfill around the moai. This suggests that the backfill has been artificially placed and is not natural, volcanic or otherwise.



Fig. 6. The volcano Rano Raraku on Rapa Nui, showing the southern slope, encircled, where the concentration of half-buried moai are found, and the subject of the following image.



Fig. 7. The southern slopes of the extinct volcano Rano Raraku, showing many moai buried up to their necks in the mounded landscape. There is no evidence of erosion in this landscape. This mountain is called 'The Nursery' as it is here where most of the moai of Rapa Nui originate, carved from the volcanic tuff, deposited here during an ancient eruption of Rano Raraku.

## 6. THE CAVE-EXCAVATE THEORY FOR THE BURIAL OF THE MOAI

There is an extensive network of caves on Easter Island, which, it is said, was big enough for the entire population to hide away when they saw a potential warring or slave-raiding ship on the horizon. Some of these caves were explored and documented by Thor Heyerdahl in hair-raising accounts in his 1957 book on Easter Island called *Aku-Aku*.

The cave-excavate theory reasons that all the material back-filled around the half-buried moai is material excavated from caves. The explanation for the fact that toki are found randomly in the backfill, is that the caves were dug with toki that were either lost in the dark, or discarded in the spoil as it came out of the earth, basketful by reed basket full, to be dumped on the slopes around the moai, many years after their construction. A possible reason that many of the toki that have been found are still fairly sharp, as seen in the picture of excavated toki above, is that they were used for digging soil and not for hammering stone.

The mounded landscape of the southern slopes of Rano Raraku is a logical result of miners tipping their basket-loads of cave-excavate material at the ends of extending pathways, in conical mounds, as mining talus is deposited today, albeit with machinery.

The evidence suggests that the moai were gradually filled around and not suddenly inundated. Only a few of the statues are leaning downhill, and this can be explained by the gradual compaction of the incremental fill behind the statues, and, rather than push the moai over, this makes them lean into the less-compacted material in front of and below the statues.

The cave-excavate theory is easy to prove by anyone on Easter Island with permission to dig a hole on Rano Raraku. Simply dig a hole in this slope, not near any moai, and see if any toki are found. If toki are found away from a moai then it can be assumed that they are associated with the backfill and not with the moai. With a few test holes it could be confirmed that toki were used for digging out the backfill and not for carving the moai.

If the fill material around the moai was the waste material dug away from the slopes above, (ie. to expose the bedrock to be able to carve out more moai), then surely they would have valued their moai enough to raise them in their holes and not bury the objects of their labours. It would seem, from the apparent disregard for the moai by the back-fillers, in not even keeping them upright while they back-filled, that the carvers of the moai were a completely different and much earlier civilisation to that of the back-fillers.

Heyerdahl tells us that the exact locations of the entrances to each of the many hundreds of separate caves on Easter Island are jealously guarded family secrets. Perhaps this is the reason why the cave system below Rano Raraku remains unknown to the public to this day. And, although it is difficult to understand why, perhaps the reason why the 'official' position on the cause of the backfilling around the moai is 'erosion', is to hide the truth about the caves of Rapa Nui.

## 7. CONCLUSION

Digging caves on Easter Island was a survival strategy with an enormous incentive, and this could very well be the reason why: 1. Huge amounts of material has been filled in around many of the moai on Rano Raraku, even burying them up to their necks, why; 2. The backfill material contains toki, and, why; 3. The slopes of Rano Raraku are mounded. The mammoth task of filling in around the moai is reminiscent of the giant undertaking of carving, transporting and raising the moai themselves, but, from the obvious disregard for the moai, the back-filling was undertaken during a subsequent era to the carving.

The inundation of the moai is unlikely to be volcanic for two reasons, firstly we are told that the last eruption of Rano Raraku was 250 000 years ago and that would mean that the moai were carved before then, and secondly the fact that toki, which are man-made stone tools, are found in the backfill.

The cave-excavate theory proposes, by the sheer volume of backfill that was moved, that this cave excavation period is indicative of a time when Easter Island had a large, healthy, working population which needed vast amounts of space underground in order to hide everyone from the periodic slave-raiding and warring ships that plied these waters.

It is possible, and from the evidence most likely, that the approximately five-meter-thick layer of soil covering the entire southern slope of Rano Raraku is material excavated from caves. The enigma of this backfill material being peppered with toki is explained by this cave-excavate theory as: rather than being associated with the moai, the toki are instead associated with the backfill. Judging by how sharp many of the excavated, presumably lost or discarded, toki still are, they are more likely to have been used as picks for digging caves, than hammers for carving moai.

## 8. REFERENCES

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