

How the Pyramids Were Built

Pt. 1 – The Pathway From Quarry to Pyramids

Approach Ramp

There is an assumption about the construction of the pyramids, which seems to be universally accepted; that the stones were lifted on a spiral ramp, hugging the walls. (In Part 3, I'll knock that out into the stratosphere.) Anyone who believes that, should also be able to accept that a ramp could have been used to bring the blocks, directly from the quarry to the building site. The only criticism to the approach ramp, I have ever heard, is that the quarry and pyramid were too far apart, but the great length is the only factor in the theory which makes it plausible enough to even consider. The longer a ramp is, the more gradual is the incline between any two points, which makes it easier to move an object along it. Such a ramp would not rival the pyramids as a feat of engineering. They were built about one mile from the quarry. A mile is 1760 yards; equal to 14.6 American Football fields, including end zones ($1760 \div 120 = 14.6$). Regardless of how they did it, whoever could build a pyramid 481 ft. high (originally, with the outer casing) covering an area equal to eight football fields, from blocks, weighing 2.5 tons, and some much heavier, could also build a ramp one mile long. There are two problems. 1} The angle of the ramp must change for each new level. The starting point must remain at ground level. If the starting level is constant, every point along the top of the ramp, must change to connect with the new working level. To raise the end of the ramp, at the building end, might not mean entirely rebuilding the ramp, but a new wedge shaped layer would be needed, deeper at the pyramid end, and thinning to zero at the starting point. The new layer could not be a single piece, but neither could the original ramp. It's not impossible, but daunting. 2} The ever increasing angle would make the ramp ever harder to climb; probably impossible unless the quarry were expanded in the direction away from the pyramid. To supply that much stone, the quarry must be so large that the exact area from which the stone was taken, would move quite a bit. Perhaps, the starting point of the ramp, could be moved farther away from the building, as the level rose, thereby minimizing the degree which the ramp's incline must increase. The additional angle of rise would be less than if the starting point were fixed. The quarrying would begin as close as possible to the pyramid, and move away, as the building grew higher. I don't know the quarry's dimensions, but it's not likely that this trick would offset the pyramids' height to maintain a useful angle of rise. It seems like the quarrying would have to move so far from the starting point, that the ramp, itself, would become another "wonder of the world".

Mud Slide

John Romer notices that we inhibit many techniques from even being conceived, because of the modern predisposition to challenge, rather than ride natural forces. We seek the most difficult route, convinced, because our designs are so often at odds with nature, that we must always collide with it. Romer says that a combination of mud and water makes a surface so slippery that the greatest weights will slide on them as if on ice.* Recreational mud slides, as popularized at the first Woodstock concert, demonstrate how slippery mud is. Mud is water and dirt. I assume that "mud and water" means a very wet mud, and the Nile would supply the water to lubricate the path. {*The Seven Wonders; Discovery, Science Channel, second week in November, '01.}

The slippery water / mud path would not be as daunting as a lubricated ramp [also discussed in Pt. 3] but the water and stone would constantly wear the path away, ever farther below the surface, bordering it. Time and other resources would be drained, constantly refilling the declivity. The mud path would have required so much water that it would have to be brought in from the Nile, and a canal is the obvious way to do that. The mud path would be an ever deepening rut, soon resembling a canal. It would have occurred to them, to simply fill it with water to make it a canal.

Canal

The trial and error process, you just heard, would not have been necessary to the Egyptians. It is universally accepted that the stones of Stonehenge were brought there, by water, and they were much bigger. On Oct. 31, 2010, after a couple of days mulling over the problem of the mudslide wearing a trench into the ground, I did a search on “Egyptian Canals”. The first page I clicked on, showed a photo of a stone-lined canal, built 1,000 years after the pyramids. It was used to move 50-ton obelisks from a quarry to the Nile, and it was a mile long. At the time of the pyramids’ construction, a branch of the Nile flowed to within a mile of the site. The quarry was also a mile from the building site. It would only require one canal connecting the quarry to the pyramids, and another connecting that one to the river. It came back to me, from my school days (5th – 8th) that the entire civilization was based on an annual inundation and canals to control it. If they hadn’t learned to guide the water to make the best use of it, they wouldn’t have lasted long enough to build the pyramids. Even where flooding was not helpful, as in a climate with significant rainfall, ditches would be essential for drainage. The very existence of the word, “ditching”, tells us how important that sort of digging has always been. In dealing with water, there is nothing in between what is necessary and what is destructive. Unnecessary water is detrimental. A sudden excess like the annual Nile flood, might be vital, but, if not controlled, would become a catastrophe. The Nile flood made agriculture possible by enriching the land with silt. The flood water must have been salvaged and stored in reservoirs because it’s needed in smaller and more regular doses than a single annual flood provides. Once they had a canal system in place, the flood might have become a mere nuisance, except for the silt, because water could be siphoned from the river, as needed.

After years of reasoning my way along this tortuous path to the always-known, I finally caught the Egyptian entry of the series, What the Ancients Knew.^{*} Early in the show, the creator and narrator, Jack Turner says, “Mimicking the natural basins that retained water when the river receded, they built canals ...” “The Egyptians invented the world’s first irrigation system”. Standing before the pyramids, Turner, says that a system of canals connected the quarry to the Nile. He says the “pyramid harbor ... connected by canals, to the Nile”, from which, the canal to the pyramid, was fed; “like a modern container port”. He describes the role of the canals, in building the pyramids, as if it has been common knowledge for some time. How can it be that I have never heard them mentioned in any discussion I have ever heard, about the pyramids, prior to Turner’s show?! (In documentaries, made since, I have seen the traditional depictions of workers placing logs from back to front of the stones, to make a kind of conveyer belt. {^{*} What the Ancients Knew; Wells, Heike G. (Writer/Producer) Edgework Media, The Science Channel, 2005})

Turner says the stones had to be dragged on land, the last stretch because it was uphill, but the

rise of the surface is irrelevant. The water would be the same depth, whatever the height of the ground, it passed through. It only required digging a little deeper to extend the canal through that deeper ground. Whereas the stones would have been exposed on all sides, over the stretch of flat ground, when they reached that slope, they must have been hidden from view by the ground on each side because the trench would be deeper along that stretch, and the surface of the water would be below the original, unexcavated ground surface. That extra depth of the trench (all above the water level) would not make the block any more difficult to manage, if the ground on either side of it, were cut wide enough to allow work space, between. (There is another answer to Turner's 'uphill haul', pertinent to How The Blocks Were Moved. [Pt. 2])

It could be that a stone bed lies beneath the surface of Giza. A stone lining keeps the canal from filling up with its own dirt, but the canal I saw on that website, did not have lined walls. You would think that mere dirt walls, created by cutting the canal, would be continually washed into the water, causing it to overflow, but, if a stone lined bottom was good enough, it would require digging to the canal bottom to find it. The builders must have known they would astonish us with the grandeur of the pyramids, and probably hoped to, but it doesn't seem like they meant to mystify anyone. As we will continue to see, in Parts 2 & 3, the only mystifying thing about the project, is why and when everyone became so mystified. If they did pave the canals to any of the pyramids, and, if the builders wanted to mystify us, they might have removed the stones, but, if they didn't bother, the canal[s] would be revealed by digging a trench, parallel to the walls of those pyramids, facing the quarry. There is a factor, discussed in Part 3, which suggests the corner that one or two canals would have been directed at the corner[s] of the walls.

Addendum

When What the Ancients Knew first aired, I skipped the one about Egypt because I just couldn't stand another enactment of hundreds of rope guys, hauling the blocks up that ramp, hugging the building. Pt. 3 will describe how the blocks were raised. Although documentaries, made in the interim, don't mention canals, I can't claim a new understanding for that part of the solution. I did figure it out, independently, only because I had to. I had forgotten my 5th - 8th grade "Social Studies". That's the euphemism teachers used in my school years, to disguise that some history was being taught. (I don't think the kids were that alienated from the subject, yet. Must have been the parents they were trying to fool.)

Footnotes

The Seven Wonders; Discovery, Science Channel, second week in November, '01

What the Ancients Knew; Wells, Heike G. (Writer/Producer) Edgework Media, The Science Channel, 2005

10/22/01 - 12/08/25

Some Work Dates

12/27-31/17

1/1-5,10,11,15,18/18

2/5,6,12,13,15,16,17,20/18

8/18/18

10/11,12/18

5/22/19

12/30,31/19

3/1,2,9/23

11/28/25 - 12/3-8/25