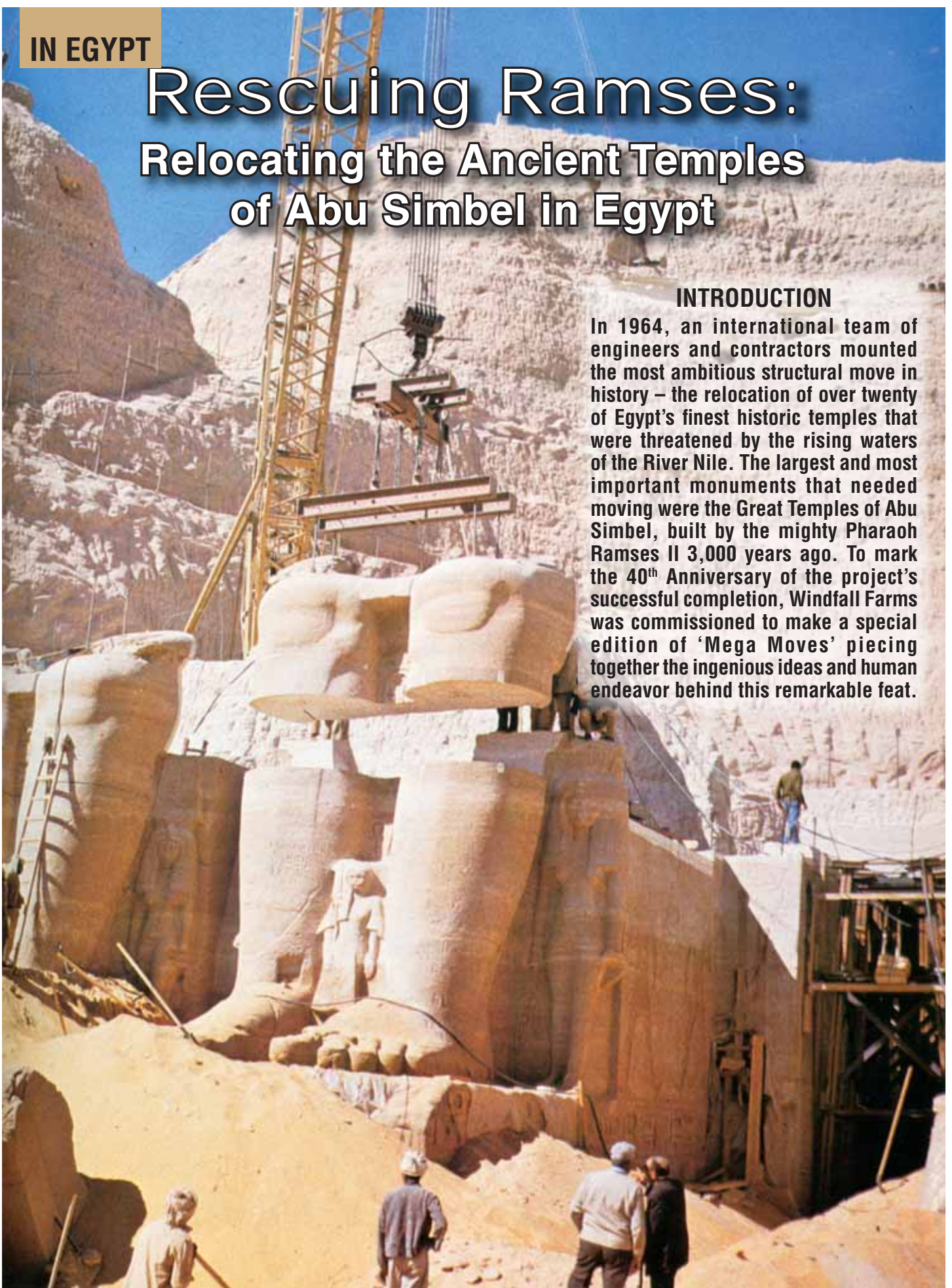


Rescuing Ramses: Relocating the Ancient Temples of Abu Simbel in Egypt

INTRODUCTION

In 1964, an international team of engineers and contractors mounted the most ambitious structural move in history – the relocation of over twenty of Egypt’s finest historic temples that were threatened by the rising waters of the River Nile. The largest and most important monuments that needed moving were the Great Temples of Abu Simbel, built by the mighty Pharaoh Ramses II 3,000 years ago. To mark the 40th Anniversary of the project’s successful completion, Windfall Farms was commissioned to make a special edition of ‘Mega Moves’ piecing together the ingenious ideas and human endeavor behind this remarkable feat.



Contributors: Carlo Massarella & Leesa Rumley – Windfall Films, London, UK

OPPOSITE PAGE: Carved on the bank of the River Nile by artisans of Pharaoh Ramses II during his reign that began in 1279 BC, the 33-meter high façade was dismantled, elevated 65 meters higher, moved 200 meters inland and reassembled.

THE SUN TEMPLE

The colossal temples of Abu Simbel sit on the shores of the River Nile in Southern Egypt. They were built by Pharaoh Ramses II, whose illustrious 67-year reign began in 1279 BC. The monuments were carved into a solid mountain, just like those at Mount Rushmore. But hidden behind the imposing 33-meter high facade are a series of halls and chambers running deep into the heart of the mountain. Statues and pillars line the hallways, with hieroglyphics adorning every wall.

Ramses' architects bestowed the Great Temple with a special power. They carefully aligned its sacred entrance so that twice a year the sun's rays would penetrate the monument to reach its inner sanctuary, lighting up the faces of statues of the gods inside.

For over 3,000 years, this extraordinary spectacle had occurred on the same two dates every year - 22 February and 22 October - attracting thousands of visitors. But in the 1960s many feared this sunlight phenomenon would never be seen again. Abu Simbel was under threat by the very geographical feature that had enabled the ancient kingdom to flourish – the River Nile.

The Egyptian Government needed to harness the power of the Nile by building the Aswan High Dam. This massive structure, almost 4-kilometers long, would create a reservoir stretching for 500km and provide enough electricity to power half of Egypt.

But the resulting lake would flood the site of more than twenty ancient monuments, including those at Abu Simbel.

INTERNATIONAL RESCUE

The Egyptian Government sent out an urgent plea to the United Nations to help save the temples. Experts from over 50 nations gathered to debate the best way to safeguard their future.

One idea was to allow Abu Simbel to flood and transform it into a colossal aquarium. Observation galleries would allow spectators above to peer down onto the submerged monument. To get a closer view, elevators would shuttle visitors underwater. The biggest problem with this plan was that the temples were carved in sandstone, a very porous material. Over time, water would erode the stone causing the temples to crumble.

They realised the only way to save the temples was to move them. Engineers calculated that the flooding of the dam would raise water levels by 60-meters. To guarantee their safety, the temples needed rising at least 65-meters higher and moved 200-meters inland.

RAISING RAMSES

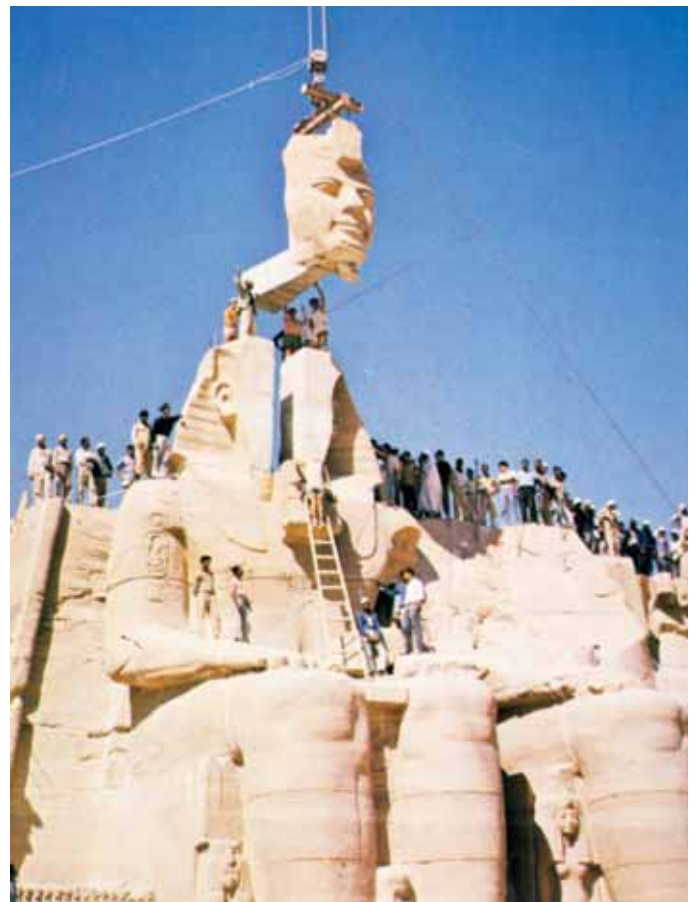
Their options for moving the temples were limited. One scheme proposed raising the temples up to the new site in a single piece. The plan was cutting around the entire monument to free it from the mountain and installing 650 hydraulic lifting jacks underneath. Lifting in unison, the jacks would raise the 250,000-ton monument one millimetre at a time.

The risk was enormous. Nothing this heavy had ever been moved before and if any of the jacks failed, the temple could be irreparably damaged, so this plan was rejected.

Another scheme proposed encasing the temples inside an immense concrete barge, so that as the water level rose, the temple could be floated to safety. But this idea was also abandoned over fears that a storm could damage the free-floating structure.

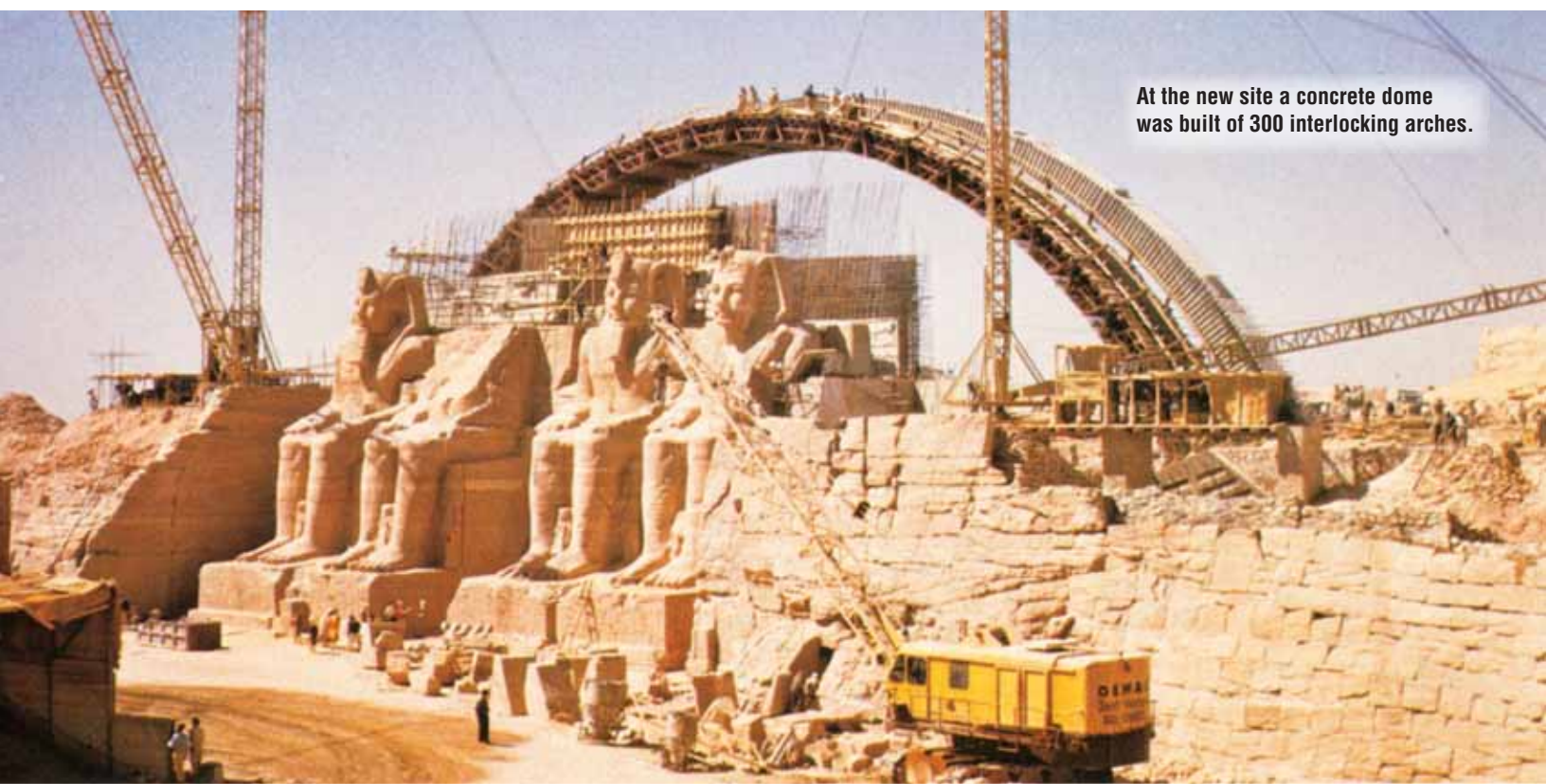


Relocating required cutting the temple into 1,050 blocks, each weighing up to 30-tons. Trucks moved each block 800 meters to a special storage area.



The heaviest, most precious blocks to be rescued at Abu Simbel were the heads of Ramses. Each weighed 30-tons.

At the new site a concrete dome was built of 300 interlocking arches.



Engineers realized Abu Simbel was simply too heavy and delicate to move intact. They decided that the only practical way was to cut the temples up into smaller blocks for the big move.

RACE AGAINST TIME & TIDE

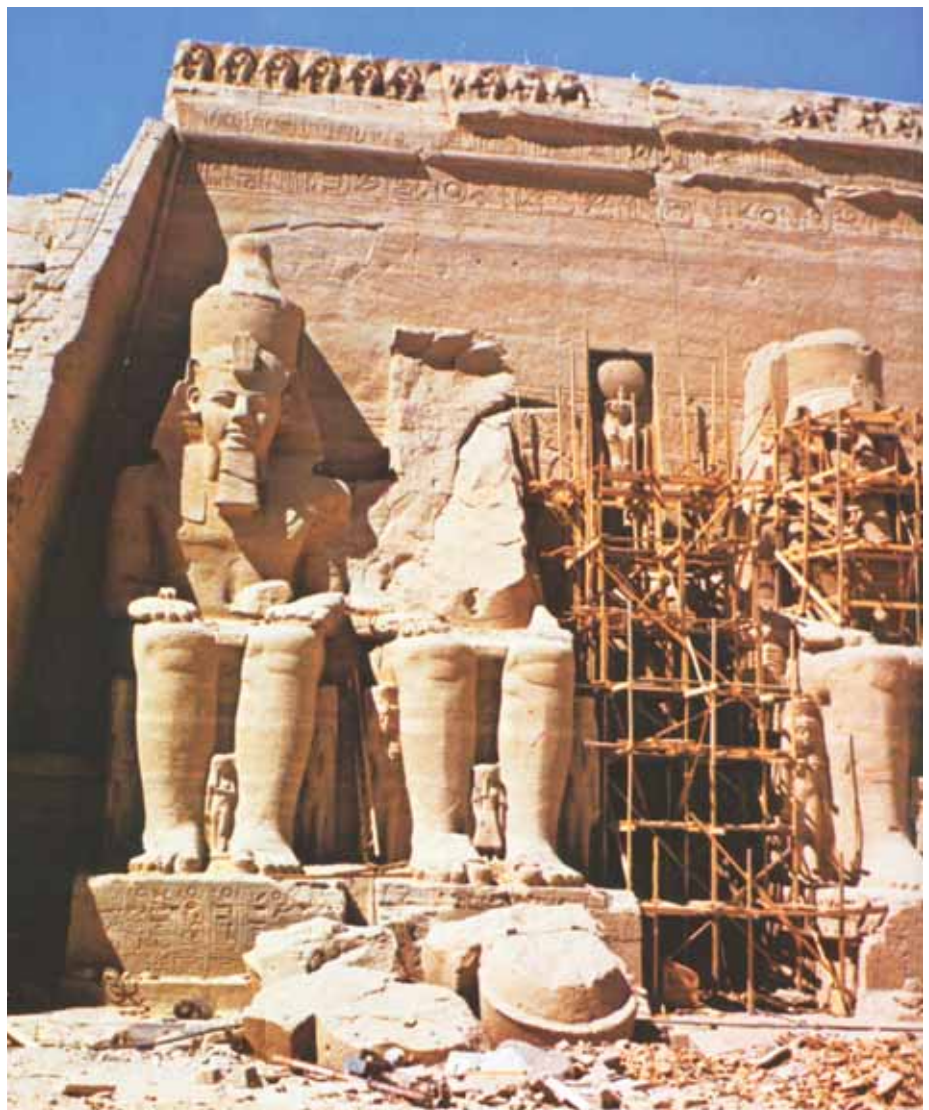
So in early 1964, an international team of 2,000 engineers and contractors from Sweden, Italy, France, Germany and Egypt began the monumental task of dismantling Abu Simbel.

They had only 6 months before the flooding Nile would be lapping at Ramses' feet. To buy themselves more time, engineers built a temporary cofferdam in front of the monument to hold back the water. But it would only give them an extra 13 months before water would start pouring over the top.

MOVING A MOUNTAIN

Before they could reach the underground temples, the engineers needed to dismantle the 330,000-ton of mountain rock resting on top. They considered using explosives, but feared that the shockwaves could damage the temples below. Instead they had to slice the mountain away using steel wire and chainsaws. It took 500 men 7 months to remove the entire mountaintop.

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Hidden behind the imposing 33-meter high façade are a series of halls and chambers running deep into the heart of the monument. The entrance to the chambers is behind the scaffolding.