

# Leaning Tower of Pisa is saved from collapse

By Malcolm Moore in Rome

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The Leaning Tower of Pisa no longer leans quite so much after a £20 million project to save it was hailed a complete success yesterday.

The tower, which was on the verge of collapse, has been straightened by 18 inches (45 centimetres) returning it to its 1838 position.

"It has straightened a little bit more than we expected, but every little helps," said Prof John Burland, an expert in soil mechanics at Imperial College London, who was the only British member of the 14-strong rescue committee.

He said the tower was still "very slightly moving" towards being upright, but that it had stabilised.

The tower, which has been leaning almost since building work first began in 1173, was closed to the public in 1990 because of safety fears. The 183-foot tower was nearly 15 feet off vertical and its structure was found to have been weakened by centuries of strain.



The Leaning Tower of Pisa has been straightened by 18 inches, returning it to its position of 1838. It has been leaning since 1173

advertisement Prof Burland said it could have collapsed "at any moment". However, it took nine years of bureaucratic wrangling before any work was done. "That was the difficult bit, getting the work going," Prof Burland said.

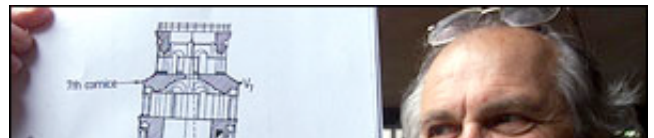
The last attempt at straightening the tower was carried out under orders from Benito Mussolini, who wanted it to be perfectly vertical.

Concrete was poured into the foundations, but the result was that the tower sank further into the soil. The straightening of the tower was praised by the president of Italy, Giorgio Napolitano.

"We have to pay homage to the extraordinary success of the very delicate task of saving a monumental symbol of our history and of our civilisation," he said. "Italy has at its disposal a cultural sensitivity and technical competence of the highest level."

The straightening work involved the extraction of around 70 tonnes of earth from the northern side of the tower, causing it to sink on that side. Before the digging started, the tower was anchored with steel cables and 600 tonnes of lead weights.

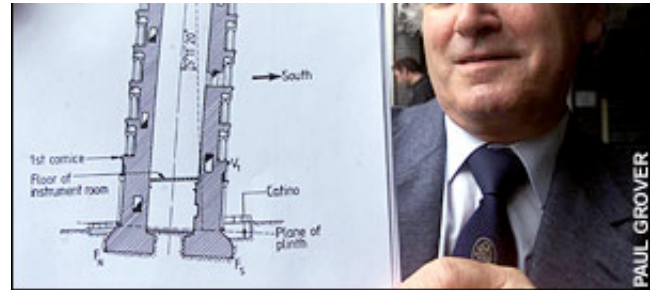
However, halfway through the project, concerns at the ugliness of the weights led to their removal and the tower lurched dramatically. "In one night, the tower moved more than it had averaged in an entire year," said Prof



Burland. The weights were hastily reattached.

"As an engineer, I felt confident that we could meet the challenge, but there were times when I really felt we were about to lose it," Prof Burland admitted.

The tower's stonework has also been restored and tourists can clearly see the difference between its levels of limestone and marble.



Prof John Burland was on the rescue committee

"If we had not stepped in the tower would have collapsed between 2030 and 2040," said Salvatore Settis, the president of the committee. "This is crucial for the tower's stability and it was a totally Italian success."

The Italian government stepped in after a tower collapsed in Pavia in 1989, killing four people. "The experts suddenly realised that the tower at Pisa, which was similarly built and on the same sort of earth, could do the same," said Pierfrancesco Pacini, the president of the group that supervises public works in Pisa.

### Towering attraction

- The Leaning Tower is the bell-tower of Pisa Cathedral and sits in the Campo dei Miracoli, or Field of Miracles
- It weighs 14,500 tonnes and is actually curved, because its builders tried to compensate for its subsidence during construction.
- During the Second World War, the tower was used as an observation post by the Germans.
- Around 2.5 million tourists visited the Campo dei Miracoli last year but tourists are only allowed into the tower in small groups.
- Until the end of August, the tower will be illuminated and open to visitors until 11pm.

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