

## A Hinged Tubular Device for the Stability of the Tower of Pisa

If we consider everything that has been said about the Tower of Pisa and the little that has actually been done in order to safeguard it, we should inevitably conclude that if the Tower has not yet mysteriously collapsed, this is due more to words than to deeds.

It has even been said that a distinguished scientist asserted the “absolute necessity to stick a cudgel into the wall of the Tower to oppose wind movements”. Now, apart from this incredible assertion, I believe that the last few years, from 1991 to today, of total inactivity on the Tower indisputably prove that the ideas for restoring its stability have been few and rather unclear.

The problem of the Tower has only one solution, which consists of two distinct operations:

- radically and urgently modifying the pressure in the soil by laying a sub-foundation;
- placing a reinforcement ring around the more stressed parts of the Tower in order to increase the bearing capacity of the material that forms it, already partially and irreparably degraded by the action of time.

I believe that this second operation has already been partially or totally carried out by the current Experts Committee for safeguarding the Tower; but I am not able to express an opinion on its effectiveness, as I have still not been able to obtain reliable information concerning the technique adopted.

The system described in this study proposes the above two operations. The variation of the present inclination of the Tower is effected by a hinged tubular steel device with circular section, located in the central part and in the east-west direction below a reinforced soil portion underlying the Tower.

The device, consisting of a lower fixed part and an upper rotating part, acts as linear hinge allowing the gradual decrease of the present inclination or the verticality, or also the counter-inclination, by starting up a system of jacks, symmetrically located with respect to it.

The structural aspect of the technique is very simple; the operational aspect is essentially simple, but extremely delicate.