

# Bed of Nails Demonstrations

One of my favorite pastimes is to be sandwiched shirtless between two beds of nails and then have one or two persons stand on top of the sandwich. And when I am really depressed, I lift my spirits by having a concrete "cinder block" placed on the top bed of nails and then smashed with a long, heavy sledge hammer hurled downward by an assistant. (This demonstration points up my observation that there is no surer way to gain a class's attention than to give a demonstration in which the teacher may very well die.) I must caution that while the first demonstration is only eccentric, the second one is quite dangerous. I have been frequently gashed by the violent scatter of concrete chunks but have been lucky enough that my teeth and eyes have gone unharmed.

I first used these demonstrations in 1974 after seeing them in a theatrical karate demonstration. In fact, I was the first to use the demonstrations in a classroom. I also used them in my Flying Circus talk (which I toured extensively through the U.S. and Canada in the 1970s and 1980s) and in my 1981 PBS show "The Kinetic Karnival." As a result, many teachers saw them, and now the demonstrations are used in countless schools in North America and elsewhere.

However, my first use of them in a classroom was not smooth. I asked a student in my class to swing the sledge hammer, but quite unwisely I chose a common small brick to be placed on top the sandwich of nails. The impact was so jarring that I lay stunned on the floor for several minutes. The students in my class were shocked, but my primary thought was that this was a rather absurd way to die.

When people stand on me, their weight is spread over enough nails in the top bed that the force on me from each nail is insufficient to pierce my skin. The force from the nails on my back is larger, because they must also support my weight. By experimenting I discovered how much weight the people standing on me can have before I am pierced. (Don't think that I go without pain, because the demonstration hurts a great deal.)

The large block that is smashed not only adds a theatrical flare to the demonstration but it also increases the safety in three subtle ways (ways that

were missing when I initially used a small block). If I am to be squeezed hard, then the block and top bed must accelerate rapidly downward; a larger block diminishes the acceleration owing to its greater mass. Much of the energy in the sledge hammer goes into rupturing the block rather than into the bed's motion. The fact that the block disintegrates means that the collision time is longer than if the block were not present, and so the force in the collision is smaller than otherwise.

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