

LEVITATION

Science, by its very nature, is always being adjusted. Science, unlike much of pseudoscience, is always questioning its tenets and revising them. Sometimes it has to reject openly a long-held belief. Such is science. But one long-held belief which is pretty well entrenched is that if a body is at rest then all the forces acting on it are balanced. So how can anyone or anything levitate? Float happily on air with no means of support? When suspended mid-air, there is a force that pulls you towards the Earth called gravity. To stay put and not fall to the ground, you need something holding you there—a push upwards to balance the downward pull of gravity. A chair does the trick well, according to classical physics. Mind power doesn't.

So I tell my physics students there must always be a balancing force and they say 'except when . . . '.

The most common 'except when . . . ' offered by students relates to the photographs they have seen of men, cross-legged in the lotus position, floating while in a meditation-induced trance. Others support this with stories they have heard quoted of mediums floating at séances, and tables levitating despite all the sitters having their hands upon them. Excitedly, at least one student in every class tells of the time four or five of them lifted a heavy person seated on a chair with just their fingers. Initially they had been heavy, but after some ritual the lifters defied gravity.

The more prosaic, having scoffed at these enthusiasts, ask

how magicians levitate women on stage, and then assure me that the same method cannot possibly explain the famous Indian rope trick. Traditionally, this involves a piece of rope rising vertically above the stage, which is able to support humans climbing it. Bloodied limbs are then tossed from its heights to the ground below.

Surely, in the face of all these examples, I have to admit gravity can be defied and the laws of physics require modification? Not before I put up a fight.

Transcendental Meditation and levitation

You have probably seen photos of men in the lotus position apparently poised mid-air. Now I admire anyone who can get into the lotus position. I admire even more anyone who can bounce up and down on a mattress in that position. But my admiration dissolves when that is publicised as being evidence of levitation. Yet this is the well-known claim of Transcendental Meditation as proposed by the Maharishi Mahesh Yogi.

The TM movement, as it is usually known, offered highly priced courses on performing miracles. These miracles included the much photographed ability to levitate.

On the *Merv Griffin Show* in 1978, the Maharishi claimed that 40 000 students had enrolled in these courses, and thousands had learned to meditate. On 9 July 1986 over 120 journalists were present in the Capital Convention Centre, Washington DC, for the first official demonstration of TM-sidhi techniques and a promise of levitation by some of the thousands who had undertaken the courses. After a lengthy introduction by the Maharishi, there were just 22 practitioners who bounced in the lotus position on mattresses. They were bouncing very vigorously and hence may well have felt a sense of levitation, but the journalists were not convinced.

In 1986 the first International Yogic Flying Competition attracted an audience of 10 000 and 70 sidhas (perfect

beings) came and hopped on mattresses. None actually remained stationary in mid-air even for a few seconds. In the ensuing years, little has changed.

Consider the photo of yogic fliers in the picture section, which appeared in our local paper in 2001. Again, they are just bouncing on mattresses. The entire mattress can be seen. The mattress was unidentifiable as such in the trimmed photograph used for publication. More convincing photographs with less sign of motion have been produced by the TM movement and skeptics alike, using a strobe flash on the camera. Excellent examples are reproduced in James Randi's book, *Flim-Flam*, where he discusses TM in more detail.

Practitioners appear to be suspended in mid-air. However, their vertical movement can be clearly seen in the blurring of their image. It is not a blurred photograph, as the perfectly focused background testifies. The moving figures are blurred in the vertical plane only, because they are moving up and down.

After so many decades, it must surely surprise the believers that they have yet to see anyone actually remain stationary. TM practitioner Peter Mason quotes the Maharishi as saying:

We teach our students that by concentration through meditation they can create an impenetrable field of energy between the ground and their bodies. The greater the field of energy, the higher the meditating man can rise. It is simple QED.

(Peter Mason, 1994, *The Maharishi*, p. 249)

Without proof of this ability to levitate, it is difficult to justify belief in a 'field of energy' as yet unknown to physics.

The ability to levitate, according to the teaching of TM, is developed in stages. Another practitioner, Peter Russell, explains:

According to the *Shiva Samhita*, an ancient Indian text, the ability to fly through the air develops in three phases. First there comes the change in breath and sensations of warmth and

vibration up and down the spine. Second comes the 'hopping like a frog' experience by many people practising the TM Sidhis [powers]. Finally there comes the ability to stay floating in the air. This stage of 'flying' is still a comparatively rare occurrence. At the time of writing very few, if any, people on current TM courses seem to be experiencing it (Russell 1978, *The TM Technique*, p. 171).

I suggest there are still none who can truly levitate using this technique.

Finger lifting

Four people stand around a heavy person. They place crossed index fingers in specific positions around the subject: under the left and right arms and under the left and right knees. Using two index fingers only, they try to lift the subject. They are too heavy for them.

The lifters then perform some ritual, which usually involves raising the hands or pressing on the subject's head. They repeat some rhyme. Again they will try the lift. On the count of three, they are told. One. Two Three. And the subject is lifted with such apparent ease that there is no doubt they have defied gravity and levitated.

This feels very real for the participants. It has been recorded over the centuries. Samuel Pepys, in the entry for 31 July 1665 in his famous diary, recorded the trick being performed by French schoolgirls and related to him by a friend who witnessed the event. A poem was used. If you wish to add some historical significance to your next party, try the game using their words:

Voyci un Corps mort,
 Royde come un Baston,
 Froid comme Marbre,
 Leger come un esprit.
 Levons te au nom de Jesus Christ.

James Randi, in *Flim Flam* (p. 215), translates the verse as:

Here is a corpse,
Stiff as a stick,
Cold as marble,
Light as a ghost.
Let us lift you in the name of Jesus Christ.

Pepys comments: 'This is one of the strangest things I ever heard, but he tells me of his owne knowledge, and I do heartily believe it to be true. I enquired of him whether they were Protestant or Catholique girles; and he told me they were Protestant, which made it the more strange to me'.

An 80-kilogram man lifted between four people is only 20 kilograms per person. Using two fingers, that is 10 kilograms per finger.

In the first attempt, the need for strict unison in lifting is not emphasised. The participants are expecting they will be unable to lift the subject. It is unlikely all would move at exactly the same time. So the lifters are not perfectly synchronised. If only one of the other participants is behind schedule by a fraction of a second, then the weight felt will be significantly more. It is likely more than one of the others is not lifting at that instant. It all happens very fast because often the subject becomes unbalanced. All agree, the subject is too heavy to lift.

Some form of ritualised counting the participants in will synchronise their timing. Repeating a rhyme and then counting has them all concentrating on the precise moment for the lift. Having been told the lift will now be easy, all the participants lift in strict unison as a result of the ritual and counting. And so they take only their portion of the weight, far less than on the previous attempt.

The effect is usually enhanced by desensitising the brain to the arm muscles. To feel this effect, stand in a doorway. Press your hands hard against the sides for at least a full minute. Then step out of the doorway. Your arms will feel light and float a little.

Psychic Uri Geller has participants place their hands above the head of the subject for a minute, while others have the hands pressed on the subject's head.

With desensitised detection of the weight, and its even distribution between participants, the subject feels much lighter than in the previous attempt.

The forces are all in balance and I don't have to revise my teaching, yet.

Levitating tables and mediums

During the séances we visited earlier, it was common for tables to move under the spirit guide, or even lift themselves from the ground. Some mediums even levitated themselves. Astonishing stories are told.

The most common story is of the table moving from side to side and lifting when all hands are placed upon it during a séance. Depending on the skill of the medium and their preparation, this may be a small or large effect.

One method used can be simply demonstrated on any light table such as a card table. Many séances were conducted around small, light tables. Press down on the side of the table and then draw your hands, still pressed firmly, towards yourself. The far legs will lift. It looks as if your hands are just resting on the table. It was usual to have the sitters just touching their little fingers, rather than holding hands, when this method was going to be used.

When the table was to be swayed first one way and then the other, another method was used. If the medium wanted to sway the table to the right, lifting the left-hand side, they would press down on the right-hand corner and out to the right of the table. Lifting the left-hand leg slightly, the rim of the sole of the left shoe could then be placed under the leg of the table to lift it. Dropping the left leg and repeating the move on the other side allowed the table to sway or even rock back and forth. Many mediums were caught doing this.

A more impressive effect was when the entire table lifted when all hands were on it. The sitters had to stand up to keep their hands on the rising table.

To do this, an array of hooks was used. Metal hooks were attached to the medium's sleeve with rope. The concealed hooks could then be attached to the table when hands were being joined. A confederate on the other side of the table was similarly attached. When the medium and confederate claimed the table was rising, they would lift their wrists slightly and it would rise. As they rose to keep their hands on the table, so the table rose with them. The effect was, in fact, the cause.

This may have been the method used by the most famous levitating medium of all, Daniel Dunglas Home (1833–1886). D.D. Home was never caught cheating, or so his supporters claim. It is always mentioned, as evidence of his bona fide talent, that he worked in a fully-lit room, which enhanced the respect in which he was held. What is often *not* mentioned is that he always requested the lights be dimmed for his most famous trick of all: levitation.

In the darkened room, recorders of Home's séances would report the way his voice seemed to come from on high and that they could feel his shoes at face level. This indicates just how dark the room must have been. The smell of boot polish enhanced the effect. All of this could easily be achieved by Home standing up, so his voice would come from higher in the room. With shoes on his hands, held at face level, the effect would match the descriptions of those who wrote down their experiences.

Sometimes writing would appear on the ceiling. Other mediums were detected using chalk attached to rods to perform this feat. Although we may consider these methods clumsy, it must be remembered that they took place under the influence of the power of the personality of D.D. Home and other mediums in an atmosphere of belief, and probably more important, a desire to believe.

Home's most famous levitation took place at Ashley House on 16 December 1868. It was described in detail by

Lord Adare, with whom he often stayed, and executed in the presence of Adare's friends Lord Lindsay and Captain Wynne. Home apparently floated out of the window of another room to enter the séance room through the window. Both rooms were on the third floor and connected only by a narrow ledge.

The three sitters had been instructed to stay in their seats, which they did. Home later took Adare to the other room where the open window was evident.

Given the dark rooms and strong suggestion placed in the minds of the sitters, is it possible Home merely went out of the room and slipped back, in the dark, to draw attention to himself by the window in the faint light? He could then open the window, appearing to climb in.

Gordon Stein's *The Lore of Levitation* covers a wide range of levitation claims. He quotes Adare's own report in *Experiences in Spiritualism with D.D. Home*, published around 1870. Adare writes that the windows were eighty feet above the ground and that there was a gap of about seven feet between the windows. Stein acknowledges that the building is no longer standing but, from the photographs of it, the two windows were only about thirty-five feet above the ground and, which is far more important, only about four feet apart. In addition, a small ledge connected the two balconies, making passing between them feasible.

We can never know what really happened that night. We can never prove Home didn't levitate as claimed. But there is certainly insufficient evidence to be sure he did. Also, although we have photographs of D.D. Home and his séances, there are only drawings of his famous levitations. Is that because the room was too dark, or because a photograph might reveal a different story?

Levitating ladies

The magician has an assistant—a lovely lady, as tradition holds. She lies down on a table while, one by one, all visible

means of support are removed. The magician passes a ring over the body to show there is nothing supporting her.

This is a very effective stage trick presented in many formats. It is usually impossible to explain by merely watching from the audience. Anyway, why spoil the fun? Magicians don't claim to be using paranormal means. We all know it is just clever conjuring.

There are a number of ingenious ways in which this effect is manufactured. In all cases there is some means of support. It may be from below and covered by draping material or some other block. It may be from behind a back curtain, or from above, hidden by the stage fittings. Some magicians use expensive hydraulic devices, others rely on more simple deceptions, such as false shoes held out on a horizontal table. Interestingly, while the body levitates, the hair and dress fabric don't. They still hang down under the conventional force of gravity.

The movement of the ring is also done in such a way as to appear to completely encircle the prone figure, but there are various ways to avoid having to pass over the support.

Magicians have come up with better and better deceptions for levitating assistants. They are magic tricks and should be enjoyed as such. They offer no challenge to gravity.

Stage levitations do not usually involve sending groundward the chopped up and bloodied limbs of the assistant. That is the unique feature of the most famous levitation trick of them all: the Indian rope trick.

The Indian rope trick

It is just after dusk and the Indian fakir stands before the crowd, resplendent in flowing robes and turban. The outdoor stage, lit by the fires and lanterns around it, is a magical sight. The fakir takes the coiled rope and tosses the weighted end into the air. It is a long rope and the top is barely visible in the dull light beyond the fires. The end disappears and there it stops.

The fakir's young assistant runs to the rope and climbs it with ease. The fakir instructs him to come down. No assistant. Again he calls his assistant. And then a third time with growing anger. The fakir climbs the rope until he, too, is barely visible. Soon the poor assistant is torn, limb from limb, and the bloodied limbs drop to the ground. An arm, then a leg, thud on the soil before the astonished crowd.

The bloodied fakir returns down the rope. He gathers the limbs and places them in a large basket. After a short time the assistant, intact, climbs from the basket to the relief of the applauding crowd.

So dearly did a member of the British Magic Circle want to see the famous rope trick that he offered five hundred pounds to anyone who could perform it. In 1919, when the offer was made through an advertisement in the *Times of India*, this was a princely sum. No one claimed the prize and the magician concluded the trick was merely a rumour. As Indian fakirs were not highly represented in the *Times of India's* readership, it is likely his conclusion was in error.

Some claim the trick never existed, but was just a journalist's hoax. However, an explanation of the trick has been proposed which not only explains how it could be done, but why it is performed so rarely, if ever.

The site for the performance of the trick needs to be an open area between hills. Therein lies the difficulty. The trick requires a black wire to be suspended between the hills such that it is invisible to the audience, which is admitted at dusk. The height of the wire needs to be at least ten metres above the ground.

A ball on the end of the rope acts as a weight. The fakir must toss the rope and ball so it hooks over the wire securely. Some writers suggest that a small child in black crawls along the wire to catch the ball. Others say the fakir tosses the rope a number of times until the hook is secured to the wire.

The rope is then suspended from this wire enabling the ground-based assistant, who is always a small child, to climb the rope. There he waits for the fakir. The latter then climbs

the rope to meet the assistant. From under his robes, the fakir takes the shaved limbs of a monkey and drops them to the ground. He bloodies his robes. The assistant clings to the fakir and descends with him, hidden by his voluminous robes.

As the fakir places the monkey limbs in the basket, the assistant slips from beneath the robes and climbs into the basket, ready to emerge.

As required, the assistant then steps from the basket to well-deserved applause.

No wonder it is rarely performed.

Conclusion

Despite many varied claims of the ability to levitate and hence defy gravity, no one has done so under test conditions. I feel confident in continuing to teach my physics class without having to include any exceptions.

References

- Gardner, Martin 1990, 'Notes of a fringe watcher: the mysterious finger-lift levitation', *Skeptical Inquirer*, vol. 15, no. 1, pp. 30–4
- Mason, Peter 1994, *The Maharishi: The Biography of the Man Who Gave Transcendental Meditation to the West*, Element, Dorset
- Randi, James 1982, *Flim-Flam: Psychics, ESP, Unicorns and other Delusions*, Prometheus Books, Buffalo, New York
- Russell, Peter 1978, *The TM Technique: An Introduction to Transcendental Meditation and the Teaching of Maharishi Mahesh Yogi*, Penguin, London
- Stein, Gordon 1989, 'The lore of levitation', *Skeptical Inquirer*, vol. 13, no. 3, pp. 277–88