left beaker if, rather than being tethered to the bottom, the Ping-Pong ball were tethered to an externally supported arm that dips into the water below the ball as in Fig. 1. (A simple way to understand this fact is that in all three illustrated cases the scale reads the weight of the glass plus the product of the pressure of the water on the bottom and the area of the bottom.3) The reason the left beaker in Hewitt’s column has a reduced scale reading when the Ping-Pong ball is tethered to its bottom is now clear: The tension in the tether pulls the beaker upward off the scale. The buoyant ball behaves like a helium balloon.

References
3. If the sides of the beaker tilted inward like an Erlenmeyer flask, the weight of the water would not be equal to the bottom pressure multiplied by the bottom area. Water pressure normal to the sides for such a flask would have an upward component that reduces the net overall fluid force on the container, as worked out in A. E. Wilson, “The hydrostatic paradox,” Phys. Teach. 33, 538–539 (Nov. 1995).

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Hewitt’s response
Carl Mungan’s insightful letter further illuminates the interesting beaker problem. It should be noted that his conclusion holds true even if the arm holding the Ping-Pong ball down in the third drawing has appreciable volume and mass.

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Buoyant beaker balls
The January 2016 “Figuring Physics” column1 compares the weight of two beakers containing the same amount of water, with a Ping-Pong ball tethered to the bottom of the left one and a lead ball held submerged in the right one by a string tied to an external support. The solution2 can be used to show that the weight of the right beaker would be the same as that of a beaker filled to the same depth of water having no ball in it. Consequently that would also be the weight of the