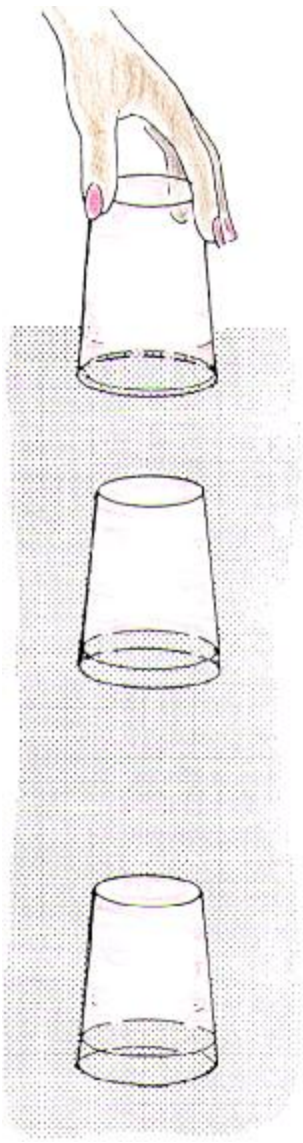
NEXT-TIME QUESTION

The inverted drinking glass filled with air is placed open-side downward in water. As it is pushed deeper, the air is compressed. How deep must the glass be pushed in order that the air be compressed to half its original volume?

At this depth, how will the buoyant force on the submerged glass compare to when it was submerged at the surface?



Hewitt Drew-it!

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Answer:

The air in the glass will be squeezed to half volume when it is pushed 10.3 meters beneath the surface. At this depth the pressure due to water is equal to the pressure of the atmosphere at the surface. This means the pressure on the air is twice at this depth. Twice the pressure, then half the volume.

Half the volume means half as much water is displaced by the glass, so the buoyant force on it is half that near the surface.