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Beak of the Week

newspaper. Count the squares, giving a value of ½ for each partial square and 1 for each square fully enclosed by the outlines. Divide by 10,000 to convert this number into square metres. The pull of gravity on you in newtons is about ten times your mass in kilograms. Divide this value by the area of your soles in square metres to find the pressure in pascals. If your feet hurt at the end of the day, now you know why. Calculate the pressure on your ankles to see why they are subject to injury.

The subject of pressure is a current battleground between advocates of SI and proponents of older, non-coherent measurements. (3) Meteorologists wish to keep the *bar*, which is used in weather forecasting. Physicians support retention of the *millimetre of mercury* (4), which refers to the pressure under a column of mercury 1 mm high. Normal human blood pressure in this unit is described with two values: 120 and 80. Physicians find the unit convenient because they measure blood pressure with a device which actually uses a column of mercury. But how do such values relate to other pressures? It is clearer to describe the pressures as about 16 and 10 kPa, roughly the pressure in a balloon. The name "millimetre of mercury" sounds more like a measure of height than pressure and so obscures the nature of the quantity it purports to describe. Despite its long history, it is absolutely useless in combination with any other sorts of measures.

Doctors will probably capitulate sooner or later, but the switch toward SI with this quantity is moving very slowly for now. Tires marked in kilopascals have been declared safety hazards. Americans evidently feel little pressure to speed up metrication.

Summary

This article has reviewed the kilogram per cubic metre, the newton, and the pascal. The next article in this series will discuss SI units of energy, power and temperature.

References

1. Lloyd W. Taylor. *Physics: The Pioneer Science.* Dover, New York. 1941.
2. C.H. Page and P. Vigoureux, (eds.). *The International System of Units.* (NBS SP 330) U.S. Government Printing Office, Washington, D.C. 1974.
3. M. Danloux-Dumesnils. *The Metric System.* Athlone Press, London. 1969.
4. "Pressures on the Millimeter of Mercury," *The New England Journal of Medicine*, Vol. 298 No. 24, pp. 1361-4. June 15, 1978.

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Beak of the Week

Research has shown that woodpeckers, at the peak of percussion, strike their beaks against trees at 1,300 mph. Upon impact, the birds' heads snap back with a force of 1,000 g's. Why don't they knock themselves out?