Letters

The Kilogram and the Mole Redux

Freeman's reply *(1)* to my letter *(2)* on the kilogram and the mole misses the point, perhaps because I was not sufficiently clear. Of his substantive criticisms, Freeman first states (correctly) I define N_A—Avogadro's number—and that I then define the kilogram (incorrect). Defining N_A in conjunction with the existing undebatable definition of a mass scale based on ^{12}C mandates, ipso facto, the kilogram metric. These are not incompatible statements which Freeman seems to interpret them to be (and, in contrast, the subsequent letter by Cvitaš recognizes as legitimate). Freeman furthermore obsesses over the artificial need to count N_A atoms, ignoring first of all, the major advances in ion beam technology and associated fast electronics which enable counting rates many, many orders of magnitude larger than he envisioned, and secondly, that the choice of how much to count governs the precision of the measurement. After all, one does not stretch out an infinitely precise tape measure 299,792,458 meters in order to time the second.

Cvitaš's somewhat hostile comment *(3)* seems more to agree with me than not, even stating "we could do without amount of substance and the mole", but takes a surprisingly defensive view that, until counting atoms can be done, no one should decide "what number of which atoms should be used to define the kilogram". That he did not recognize that the integer for N_A specified in my suggestion was chosen to be both consistent with current precision and also divisible exactly by 12 is my lapse in anticipation. Nevertheless, Cvitaš reveals his territorial bias by asserting "this *Journal* is not a journal for discussing metrological problems encountered in precise definitions of units". Cvitaš serves on IUPAC's Interdivisional Committee on Terminology, Nomenclature and Symbols (ICTNS), an appointment that was not noted in his comment despite its relevance to the issue. But, readers should know that the ICTNS is a group that has had its historical share of controversial decisions. My food-for-thought letter was meant to be stimulating, provocative, and perhaps constructive. It is not for Cvitaš to tell this *Journal* what it may or may not undertake that is of interest to its readership.

Literature Cited

1. Freeman, R. D. *J. Chem. Educ.* **2004**, *80*, 800.
2. Karol, P. J. *J. Chem. Educ.* **2004**, *80*, 800.
3. Cvitaš, T. *J. Chem. Educ.* **2004**, *80*, 801.

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Editor's Note:

Karol concludes that "it is not for any author to tell this *Journal* what it may or may not undertake", which is correct. That is the Editor's prerogative. My view, however, is more in line with Cvitaš's. How to define units is not the purview of this *Journal*, nor do we have the expertise to decide what to publish on the subject. I think it is useful to readers of this *Journal* to be aware of what is being considered by those committees and in those journals devoted to defining units, because some definitions are likely to be better than others from a pedagogical viewpoint and the *JCE* community could provide useful input into such deliberations. Henceforth I will entertain manuscripts from official groups whose purview is defining and naming units, where the manuscripts inform readers and allow for input to said groups, but I will not entertain manuscripts that initiate proposals for defining and naming units.