Letters

Women Scientists

The editorial "Science for the misses" [*Science* **129**, 749 (1959)] leads me to believe that your readers will be interested in some data which I have assembled (with the help of Barbara Drew Atwood). Graduates of seven women's colleges who are included in *American Men of Science* were counted, and the numbers were expressed as percentages of total living graduates of the respective colleges. The results follow (the first percentage is for the physical sciences; the second, for the biological): Mt. Holyoke, 0.46, 0.75; Bryn Mawr, 0.48, 0.57; Goucher, 0.40, 0.53; Vassar, 0.34, 0.32; Wellesley, 0.24, 0.24; Smith, 0.14, 0.25; and Radcliffe, 0.14, 0.13. The total is 532/87,012, or 0.61 percent.

Less than 1 percent of the 87,012 alumnae who were living in 1956 are in *American Men of Science*. Is this an indication of lack of opportunity for women scientists, of less innate scientific ability in women, or of women's greater interest in home, children, and cultural activities other than scientific?

I believe that both men and women can be grouped into three categories: (i) those who must be scientists at any cost; (ii) those who are not interested and who would never be scientists; (iii) a group intermediate in size—those who, under the stimulus of economic necessity, prefer science to any other field. Most men in both categories (i) and (iii) become scientists. Women in group (i) persist in their study, but most women in group (iii) work as assistants, and so on, until marriage, children, or economic improvement releases them.

I sometimes wonder, after many years of teaching college science, if it is wise to urge or to tempt persons, men or women, in group (iii) to become scientists. To give all possible aid and encouragement to those in group (i) might, in the long run, accomplish more.

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Supercooled or Subcooled?

Braham's article, "How does a raindrop grow?" [*Science* **129**, 123 (1959)], is an excellent survey of our knowledge on this subject. I would, however, like to raise a question about the use of the word *subcooled* to indicate cooling of water below 0°C. To the cloud physicist and other scientists, *subcooled* and *supercooled* are generally regarded as interchangeable. It seems, however, a little unwise and completely unnecessary for scientists to use two words, which, it would seem from their structure, ought to have opposite meanings, to indicate

the same thing. The prefix *sub* ordinarily is accepted as meaning "less than," and *super,* as meaning "more than" (for example, *subhuman* and *superhuman*). Inasmuch as the word being modified by the prefix is *cooled* and not *temperature,* it appears that the word *supercooled* is preferable to *subcooled* for indicating excessive cooling.

In reaching this conclusion I examined two standard sources [*Webster's New Collegiate Dictionary* (Merriam-Webster, 1958) and the *U.S. Weather Bureau Weather Glossary* (1945)]. Both listed *supercooled* ("to cool below the freezing point without solidification"); neither listed *subcooled.*

In view of the above considerations and in view of the fact that so many scientific articles are now read by nonscientists and by foreign scientists, I would like to suggest that serious consideration be given to avoiding the ambiguity that might arise from use of the word *subcooled* (and, similarly, *undercooled*) in scientific writing.

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The practice, in meteorology, of using interchangeably the words *subcooled* and *supercooled* (and also *undercooled*) when referring to liquid water which has been cooled to temperatures colder than 0°C is unfortunate indeed. To this extent I agree heartily with Appleman.

However, I cannot agree that it would be preferable to restrict ourselves to the term *supercooled.* My reason for preferring *subcooled* and *undercooled* is etymological. The point of reference which is implied in the use of all such words (for example, *superheated, supersaturated, subsaturated*) is that of the equilibrium condition. In this context the prefix *sub* denotes *under, below, beneath,* whereas *super* denotes *over, above*; therefore it seems preferable to use the terms *subcooled* and *superheated* when referring to a phase which has been cooled below or heated above its equilibrium temperature. On etymological grounds the term *undercooled* is even more desirable than *subcooled* because it is usually regarded as undesirable to mix words of Latin-Greek and Anglo-Saxon roots.

I consider it unfortunate that most desk-size dictionaries list *supercooled* but not *subcooled.* However, I have learned from one of the compilers that the 1959 edition of the *Weather Glossary* will cite *subcooled* as preferable to *supercooled.* I also find many other scientists who feel that it is desirable to make this change in nomenclature [for example, see Johnson, *Physical Meteorology,* p. 240; MacDonald, *Advances in Geophysics,* p. 245].

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