the military use of herbicides, Sachs and others are referred to another brief article of mine in the *Friends Journal* **16**, 193 (1970). It should be obvious, however, that my personal political and moral views are separate from and irrelevant to the AAAS study.

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More Mislabeling—More Frustration

Letters by Goldman (16 Jan.) and Prescott (12 June) concerned the increasing unreliability of labels on radioactive biochemical products, even those obtained from the more reputable suppliers. Our recent experience indicates that the same complaint extends to the calibrated and certificated radioactive standard sources furnished by such "reputable suppliers." Not only do the standards differ widely, but there seems to be an increasing lack of understanding of the most fundamental definition of terms which at one time, at least, had been unequivocally defined.

We recently undertook some experiments requiring the use of ^{14}C. In order to properly interpret some preliminary results involving planchet counting, we borrowed from our colleagues two ^{14}C reference disc sources obtained from different suppliers, each labeled as representing a specified number of microcuries. Since the resulting calibrations differed by more than 50 percent, we inquired of the suppliers as to the method of preparation. The first supplier provided full details on construction, indicating appropriate correction factors for absorption by the thin cover, and so forth. Repeated phone calls to the second supplier failed to uncover any details concerning our specific source, and provided conflicting stories concerning their ^{14}C sources in general.

Our attempt to purchase another reliable calibration standard proved disastrous. Unlike the "weightless" samples used by the first supplier, this third supplier prepares his ^{14}C sources by collecting ^{14}C-labeled $BaCO_3$ on filter paper. He then calibrates the source and expresses the microcurie content "based upon emission rate and not contained activity." The first two standards shipped by this third supplier differed by a factor of 100, neither was near the catalog microcurie value, and both were more than a factor of 4 below their respectively certified microcurie

value by their own rather arbitrary definition. The third attempt to fill this order produced a source which seemed to be high by just a factor of 2. A telephone call to the supplier produced the information that the source had been "calibrated for 2π geometry" and that the listed microcurie value on the attached certificate should be corrected to so state. I must confess that had I seen such a statement on the certificate I would not have known whether to multiply or divide by 2 for 4π geometry.

I cannot help wondering what new theories have been reported in the literature based upon research results about which the authors were sufficiently naive to accept such "standards" at face value. I shudder to think of the possible consequences if a similar erroneous standard is sent to the radiology department of a hospital and is used to determine dosage of some radioisotope delivered to a patient.

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Mutagens and Carcinogens

Although there is much public concern for the genetic and cancer hazards of a number of uncertain factors, little has been done to prevent the ignorant or inadvertent use of compounds produced primarily for the induction of mutation and cancer. The majority of these agents can be purchased from a number of supply houses without evidence of proper qualification. Generally, neither the catalogs nor the labels on the containers carry information about the biological danger involved in handling them. Rarely is it possible to locate information quickly concerning the half-life of these compounds in solution, and it is even more difficult to find answers to problems of spillage. How many users know what happens to these chemicals when they are disposed of through the sewer, and how many plumbers are aware of the danger they face performing routine work around research laboratories or in industry?

I am well aware that the biological effects of the majority of organic compounds cannot be determined or stated with certainty, but at least the few hundred proven mutagens and carcinogens should be identified as such on the label by the manufacturer or distributor.