Letter to the Editor

OF MICE AND MEN

Our paper in the *Journal of Nuclear Medicine Technology* of March 1977 (Vol. 5, No. 1) has received criticism from New England Nuclear (NEN) regarding the mouse bioassay procedure. The NEN preparation is injected, without dilution, into rats after labeling a vial with 300-400 mCi of ^{99m}Tc. We have no quarrel with this procedure and have duplicated their results which show >90% uptake in lungs at 5-10 min after making a small dilution to ensure that <50,000 particles are administered. We do feel, however, that such a procedure is not a valid representation of what happens when this product is used in a much larger volume of distribution (such as humans). It is for this reason that we dilute the labeled preparation about 1:100 before bioassay. The final injected dose of 20 μCi consists of 10,000-20,000 particles in 0.1 ml. This is the method recommended in *USP XIX*. The bioassay results also appear to depend on the number of particles administered. We performed a tissue distribution of 25–30-gm mice, and at 10 min after administration the results in Table 1 were obtained:

TABLE 1. Results of Tissue Distribution Study in Mice

Number of particles administered	Percent of net dose in lungs at 10 min
300,000 ± 60,000	80.2 ± 1.9 n = 3
100,000 ± 20,000	84.3 ± 2.2 n = 4
50,000 ± 10,000	89.5 ± 2.2 n = 3
15,000 ± 3,000	91.3 ± 2.8 n = 3

In these studies Pulmolite was injected without dilution. Recovery of injected activity was >95%. Radioactivity in the blood was monitored for the 15,000-particle injection only and was found to be 3.9 ± 0.2%. We found 9.3 ± 0.8% in the blood when the product was diluted 1:100. Therefore, the bioassay could depend on both dilution and the number of particles administered.

The evaluation of four commercially available ^{99m}Tc-MAA kits has been completed and several more are under investigation. It may be of interest to note that none of them has shown any instability when diluted. Blood activity in mice 5–10 min after injection has been insignificant. In addition, protein peaks such as displayed in Fig. 1 of our article were not observed nor could the presence of soluble labeled protein in the supernatant from the *USP XIX* centrifugation procedure be detected by TCA precipitation. We were not able to detect kidney activity in patients monitored with 20 min after injection with two of these preparations. One of the MAA products currently being evaluated has been found to contain significant quantites of a ^{99m}Tc-labeled soluble protein and shows chromatographic and biodistribution characteristics similar to those of Pulmolite. We hope to have a complete evaluation of most of the commercial MAA kits available shortly.

J. R. McLEAN and PAUL WISE
Radiation Protection Bureau
Ottawa, Canada