AUTHORS' REPLY

The points made by Drs. Saha and Farrer in regard to our papers concerning 99mTc-DTPA are well taken. We are grateful for their careful reading of the data.

The first point to which they refer is the problem of disparate half-times (for the second component of the average total-body retention) of approximately 9 hr in the first reference and more than 20 hr in the second reference. It will be noted that our data were only carried out to 24 hr. In this instance, there is considerable inherent error in determination of a half-time for a component equivalent to the entire data collection. In order to provide sufficient accuracy for this component, it would have been necessary to carry out the determinations for about 3 days. This would not be feasible with the short half-lived 99mTc. In addition, it will be noted that the standard deviations about each point were very large in the earlier paper whereas they are relatively small in the later publication. Therefore, we do not feel that the data indicate any great discrepancy in the biological behavior so far as their total-body retention is concerned.

Drs. Saha and Farrer are correct in stating that we chose to ignore the existence of a third component in analyzing the plasma disappearance curves of 99mTc-DTPA and 123I-iodoalcoholate in our later publication. The reasons for lack of reliability in this third component cited above exist for the plasma disappearance levels as well. We therefore chose to run the data through the computer asking only for a two-component result. However, in response to this query, we have gone back through our data and rerun it for a three-component solution. The differences are quite small. The first component has a $T_{1/2}$ of 15.6 min compared with the published 15.4 min; the second component is 118.4 min compared with the published 126.4 min, and the third component is 13.6 hr. The third component comprises less than 2% of the total administered dose.

In the clinical determination of glomerular filtration rate by the "single-shot" method it will be impractical to carry out determinations over a long enough period of time to obtain an accurate estimate of the third component. We feel that the second component of the curve is the major one to consider in determining the glomerular filtration rate and if the method is done in a standardized manner, the results should be useful. Our usual method involves obtaining plasma samples at 21/2, 3, and 31/2 hr after injection. When these are plotted on semilogarithmic paper they almost always fall on a straight line.

H. L. ATKINS
J. F. KLOPPER
W. HAUSER
W. ECKELMAN
P. RICHARDS
Brookhaven National Laboratory
Upton, New York

INADVERTENT INTRA-ARTERIAL INJECTION OF MAA PARTICLES

A preparation of macroaggregated albumin (MAA) labeled with 99mTc was inadvertently injected into the left brachial artery instead of into an antecubital vein. Almost immediately, the patient complained of numbness of the finger tips, and the hand and forearm became dead white. Within 30 min the whiteness had mainly changed to a blotty purple, and after 2 hr her color had returned to normal except for persistent whiteness at the tips of her middle and ring fingers. The next day she had neither symptoms nor abnormal signs.

The preparations used for lung scanning consist of particles of 10–50-micron diam which, when injected intravenously, are arrested by the capillaries or arterioles in the pulmonary bed and subsequently break down with a half-time of about 6 hr. In normal lungs only 1 in 200 to 1 in 1,000 capillaries are blocked (1), and this large safety margin means that the injection has no hemodynamic effect on the pulmonary circulation. The preparation used here contained approximately 1.5 mg of albumin, giving an estimated total of 1/2–1 million particles (2), and this had an immediate and marked effect on the circulation in the arm. Most of the particles were deposited in the finger tips, probably in the arteriovenous shunts. Intra-arterial injection of MAA is not a procedure to be recommended, being alarming both for the patient and for the doctor. However, no specific treatment was required and full recovery occurred.

J. O. WILLIAMS
St. Thomas Hospital
London, England

REFERENCES

1. DWORKIN HJ, SMITH JR, BULL FE: A reaction following administration of macroaggregated albumin (MAA) for a lung scan. Amer J Roentgen 98: 427–433, 1966