methodology, and correct application of this information to the patient's case is of utmost importance.

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REFERENCES

1. HURLEY PJ, Red cell and plasma volumes in normal adults. *J Nucl Med* 16: 46–52, 1975

2. ALBERT SN: *Blood Volume and Extracellular Fluid Volume*, 2nd ed, Springfield, Ill, CC Thomas, 1971, p 209

3. ALBERT SN: Blood volume in clinical practice. In *Nuclear Medicine In Vitro*, Rothfeld B, ed, Philadelphia, Lippincott, 1974, Chap 5

4. OGA R, FUJITA T, FUKUDA G: Normal values of circulating blood volume in Japanese population. In *Blood Volume and Extracellular Fluid Volume*, Albert SN, ed, Tokyo, Shinko-Koeki, 1974, Part III, p 251

5. HIDALGO JU, NADLER SB, BLOCH T: The use of the electronic digital computer to determine best fit of blood volume formulas. *J Nucl Med* 3: 94–99, 1962

THE AUTHOR'S REPLY

The study on red cell and plasma volumes in normal adults specifically avoided "amusing mathematical exercises" in establishing normal values. The mean values presented are of actual volume measurements recorded in the literature. Predictive equations such as those listed in Table 6 (*1*) (and also, incidentally, used by Hidalgo et al) were not used except in a few instances to help in curve-fitting.

Of course, direct measurement of both red cell and plasma volumes is preferable to the use of the so-called F_{cell} ratio, but collection of sufficient data points was essential for the type of analysis used. Wherever possible, when there were enough directly measured values, F_{cell} measurements were not included. Because of obvious difficulties in collecting large numbers of normal values, the data were not my own. All this is clearly stated in the paper. As Dr. Albert admits, complete mixing and equilibration can be expected at 15 min in normal people. If he feels the situation may be different in certain patients, he can try to verify equilibration by additional measurements.

There is more to such data, particularly concerning red cell volume, than guiding replacement therapy. If Dr. Albert finds existing tables of mean normal values a "good guide," I do not see why he should reject additional information about the normal range. I cannot see much value in one without the other. I do agree that normal ranges must always be used with judgment and in context and not as an infrangible law. Nevertheless, I thought, and continue to hope, that my observations of actual mean values and a more or less constant relative standard deviation could be helpful in interpreting clinical volume measurements.

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REFERENCE

1. HURLEY PJ: Red cell and plasma volumes in normal adults. *J Nucl Med* 16: 46–52, 1975

ANATOMIC LANDMARKS ON SCINTIPHOTOS

Raikar and Ganatra (*1*) have reported a method of putting anatomic landmarks onto scintiphotos using the facilities of a Nuclear Data Med II system. Having used this technique for some time, we have now developed a method based on software written for a Med II that offers a considerable improvement in simplicity and versatility over the method described by Raikar and Ganatra.

In use and effect our method is similar to the anatomic marker facility on the Nuclear Enterprises Scinticamera V. A small active source (10 mCi of ^{241}Am), shielded to the patient, is positioned over the anatomic landmark. Operation of a "Mark" button causes a single dot of high intensity to be placed on the image currently being displayed by the computer at a position corresponding to the center of the source. After any number of marks have been placed, operation of a second button "End Mark" terminates the program.

The program is a simple one. Data from the scintillation camera (Nuclear Data Radicamera) are registered in the list mode of acquisition. The addresses stored in this manner are separated into X and Y components and the arithmetic means of the components are calculated. These means are recombined to form an address that is effectively the centroid of the activity in the small source. The contents of this address are changed to 4K giving a bright spot on the image. The number of counts registered from natural background and patient ac-

tivity is assumed negligible. Program run-time for each mark is 50 msec including data collection time.

The program is entered through a user-written function consistent with the Nuclear Data language NUTRAN. Entry to the acquire-mark loop ("Mark") and exit from the program to NUTRAN text ("End Mark") are by two remote hardware interrupt lines that are standard to the Nuclear Data Dual Isotope Interface. Details of the program will be sent on request to any reader.

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REFERENCE

1. RAIKAR UR, GANATRA RD: Anatomic marks on scintiphotos. *J Nucl Med* 15: 1226–1227, 1974

DESIGN OF A NEW LIQUID SCINTILLATION VIAL

In the charcoal separation method for radioimmunoassay, transfer of the last drop from the radioimmunoassay (RIA) tube to the scintillation vial (using the principle of superficial tension) is not simple. Transfer is variable, incomplete, and error can be considerable. I propose a new design for liquid scintillation vials (Fig. 1) intended to avoid this problem.

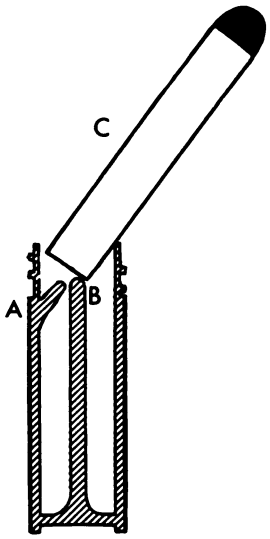

FIG. 1. Cross section of liquid scintillation vial with (A) lateral protuberance, (B) central stem, and (C) RIA tube.

Figure 1 illustrates a solution to the problem in either of two ways: a stem can be provided in the middle of the vial (of suitable material) or a protuberance from the border of the vial can be built. With either method, the last drop of supernatant in the RIA tube can be easily and totally transferred to the vial by touching the prolongation. Use of scintillation vials with such a modification should improve the accuracy of measurements.

Using common scintillation vials with plastic or wooden sticks attached, I have demonstrated the feasibility of this design in pilot studies. The modified vials are easy to use and appear to facilitate quantitative transfer.

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"POLYPHOSPHATE BONE SCANS, ^{32}PHOSPHORUS, AND ADENOCARCINOMA OF THE THYROID"

The article by Klinger (*1*) on the role of bone scans and ^{32}P therapy in adenocarcinoma of the thyroid contains several statements that make interesting reading. However, one loose phrase, to wit, ". . . the drop in RBC with radioactive iodine . . ." should not go unchallenged since it produces an inference that may be quoted subsequently, yet is probably incorrect. The authors presented no evidence to support a relationship between the decrease in hematocrit and the radioiodine therapy except a temporal relationship between the two events. Even this temporal relationship seems contrary to the inference since the decrease in hematocrit appeared to be prompt, whereas if ^{131}I-induced, one would expect it to have been delayed several weeks.

Furthermore, the amounts of radioiodine administered appear particularly inadequate to depress the bone marrow in view of the lack of selective localization of ^{131}I in the skeleton of this patient.

Perhaps there was clearly an association between the ^{181}I therapy and the drop in hematocrit but no cause and effect relationship should be inferred until a sound mechanism is available. I hope that the author will explore other explanations for the drop in hematocrit.

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REFERENCE

1. KLINGER L: Polyphosphate bone scans, ^{32}Phosphorus, and adenocarcinoma of the thyroid. *J Nucl Med* 15: 1037–1038, 1974