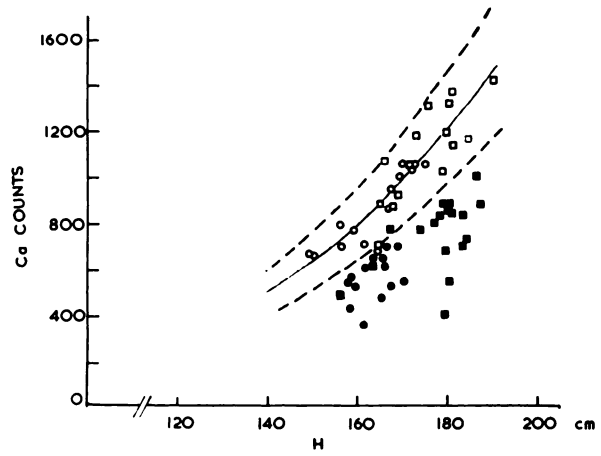

FIG. 1. Calcium-49 counts, from all patients and volunteers not over 55 yr of age, as a function of body size (mean of maximum height and arm span). Males are indicated by squares, females by circles. Open symbols are for normal volunteers, closed symbols for patients with proven osteoporosis. Solid line shows mean for normal volunteers, dotted lines ±2 s.d.

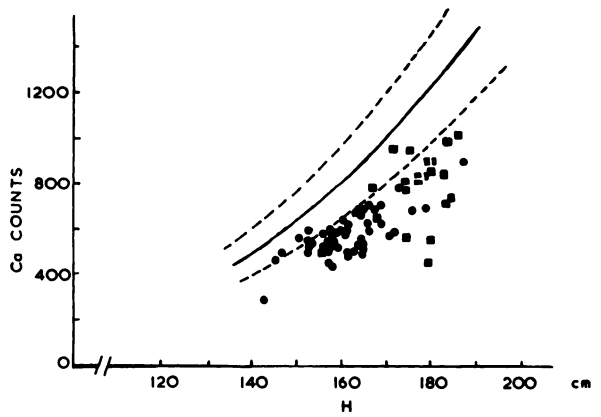

FIG. 2. Results for osteoporotics of all ages. Males are indicated by squares, females by circles. Lines are taken from Fig. 1.

values for osteoporotic patients of all ages. Again, the separation between normal adults ≤55 yr and patients is clear.

In terms of CaBI, the normal mean is 1.00 (s.d. = 0.1), and that for all osteoporotics is 0.69 (s.d. = 0.11). The mean age for all osteoporotics was 56 yr (range, 21–78). Subdividing, the 32 patients ≤55 yr had a mean CaBI of 0.66 (±0.10), and the 43 subjects over 55 yr had a mean value of 0.70 (±0.10); these two groups are not significantly different ($p > 0.05$). We note that 88% of the osteoporotic subjects have a CaBI less than 0.80–2 s.d. below the normal mean.

Finally, 26 volunteers over 55 (mean age 64 yr, range 59–75) had a mean CaBI of 0.88 (±0.13), the 11 men having a higher value (0.96 ± 0.13) than the 15 females (0.83 ± 0.10).

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Reply

Our statement regarding the need for an instrument capable of measuring bone mineral in the axial skeleton was not made with the intention to minimize the contributions already made in this direction. On the contrary, several very promising new techniques have been developed in the last decade. The most promising approaches in my opinion are the neutron activation analysis as described above by McNeill, et al. and the dual photon attenuation techniques developed independently by Price, et al. (*1*) and Mazess, et al. (*2*). While the technical problems of these techniques seem almost resolved, the definition of normal and abnormal and clearly defined indications for the usefulness of these techniques are still being considered.

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A Case Report of Lymphangioleiomyomatosis?

In the article by J. M. Woolfenden and T. B. Struse, entitled "Diagnosis of Chylothorax with ^{131}I-Triolein: Case Report", in the February issue of the *Journal*, they describe a method of diagnosing chylous effusion and present a case report of a chylothorax in a 37-year-old woman, in whom a definite diagnosis has not been established.

In their discussion they analyze various causes of chylothorax but fail to include lymphangioleiomyomatosis as one of the differential possibilities. Lymphangioleiomyomatosis was first recognized as a special entity by Laipply and Sher-

rick (*1*). Since then 61 new cases have been reported and we have in preparation another case.

All the cases reported have been in females (*2*) with no familial tendency. Symptoms first appear at any time during reproductive years and the disease is marked by breathlessness of increasing severity, usually ending in death from respiratory failure. Pneumothorax and chylous effusion are common, and there is a hemorrhagic tendency that is confined to the lung.

The primary pathologic change is shown to be in the lymph vessels of the abdomen, mediastinum, and lung, and in lymph nodes that are infiltrated by smooth-muscle cells, with blockage of the channels, dilatation of the draining lymph vessels, and leakage, giving rise to the chylothorax, chlyous ascites (*3*), and chyluria (*4*). The pathologic abnormalities present in the lung, which is the major organ involved, were proliferation of the smooth muscle associated with lymphatic vessels surrounding the acini of the lungs, causing a valve-like narrowing at the junction of the respiratory bronchioles with the alveolar ducts. This results in the development of emphysema-like dilatation of the acini and marked air-trapping. No significant pulmonary fibrosis was noted.

The main problems still to be clarified in this condition are the exact abnormalities in pulmonary function—especially compliance, possible endocrine abnormalities, and also the possible relationship to tuberous sclerosis (*5*), raised by some authors because of the high incidence of renal angiomyolipomas in these cases.

If my impression that this case is one of lymphangioleiomyomatosis is correct, the diagnosis can be established by means of a lung biopsy. I suggest that investigation of this woman's pulmonary function and compliance, using the body plethysmograph to assess lung volumes, would further clarify this condition, as would endocrine and chromosomal studies.

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Reply

The patient described in the Case Report, "Diagnosis of Chylothorax with ^{131}I-Triolein," began to have slowly progressive dyspnea after we had prepared the Case Report. Chylothorax did not recur. Increasing pulmonary insufficiency terminated in death due to respiratory failure. At postmortem examination, the normal pulmonary parenchymal architecture was completely replaced by diffuse honeycombing with many fibrous strands producing a sponge-like appearance. Normal pulmonary elasticity was absent. There was no evidence of chylothorax or chylous ascites.

Microscopic examination of the lymphatic system showed lymphangioleiomyomatosis involving peribronchial and mediastinal periaortic lymph nodes, as well as abdominal periaortic and pelvic lymph nodes.

We thank Dr. Demajo for his comments.

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Nuclear Medicine vs Ultrasound

Although appreciating the value of the Sanders and Sanders article (*1*) as an attempt to produce an overview of the relative merits of ultrasound and nuclear medicine, we wish to point out that some of their statements and conclusions reached about the value of ultrasound differ significantly from our experience and the use of ultrasound as practiced at the Yale–New Haven Hospital. For comparison, I would like to summarize our experience in grey-scale techniques of the liver since 1973.

We disagree that only the more florid examples of diffuse liver disease can be diagnosed and that the modality is less sensitive than the Tc-99m sulfur colloid scan. Moreover, we have not found that "nuclear medicine techniques are more sensitive for detecting lesions close to the surface." In a series of articles published over the past 4 yr (*2–6*), we have shown that grey-scale ultrasonic techniques are more specific and sensitive in the demonstration of both diffuse and focal disease. We do agree, however, that radionuclide scans of the liver provide a valuable screening procedure and that ultrasound is a complementary modality (*6*). The statement that "the major role of ultrasound should be that of determining whether a lesion found by radionuclide imaging is solid or cystic," pertains to the bistable techniques and denies the improvements in differential diagnosis due to the improved grey-scale instrumentation. For example, in purely cystic lesions, we are able to differentiate between simple cysts, abscesses, and necrotic metastases in liver with an accuracy approaching 90%.

In our experience with liver abscesses, we most commonly see the surrounding liver tissue showing an inflammatory reaction as indicated by a zone of high-level echoes. The long-standing abscesses show a thick rim of such echoes, which is consistent with a thick fibrous capusle. This is contrary to Dr. Sanders' statement that abscesses may be surrounded by "a zone of decreased echoes, compared with the rest of the liver."

Dr. Sanders' experience with ultrasound in the biliary system is again markedly different from our own. He states that "large intrahepatic biliary radicles can be seen if the ducts are sufficiently dilated; and in practice, this implies a bilirubin value of 6–8 mg per 100 ml." We have now followed up 220 patients with jaundice, many of whom had a serum bilirubin of 1.5 mg per 100 ml, and yet dilated ducts were clearly visible. In personal communications we have found a number of other groups with similar results.

Finally, our recent experience with gallium-67 and ultrasound for the detection of abdominal and pelvic abscesses is leading us to a conclusion different from Dr. Sanders' statement that "generally ultrasonic examination is not as good a screening technique as the gallium study." Our overall