results confirm this trend on a larger scale (*4*). In 59 apparently healthy male nonsmokers aged 19–73 yr (mean = 49.8 ± 13.5 yr), the regional uptake of thallium in the thighs and calves was found to be negatively correlated with age ($r = -0.40$; $p < 0.001$ and $r = -0.23$; $p < 0.05$). Indexes of asymmetry in the calves only were also weakly but significantly correlated with age ($r = 0.23$; $p < 0.05$). This suggests subclinical peripheral vascular disease in some patients although none of them had coronary artery disease or smoking habits. This study shows how difficult it is to define normal values for indexes of asymmetry, particularly in older male patients who have a relatively high prevalence of subclinical atherosclerosis. Nevertheless, asymmetry seems to be a more specific sign of peripheral arterial disease, although it remains to be quantified at each level of the legs with the buttocks being more asymmetric than the thighs and calves. In another study (*5*), 114 male patients with proven coronary artery disease exercised at levels near their maximum capacity. Whole-body thallium scintigraphy showed an asymptomatic interextremity asymmetry in 54% of the cases. The prevalence of this sign increased with age, from less than 14% for those younger than 45 yr to 65% in patients older than 65 yr. These results were obtained by both the lecture of analogic images and quantitative analysis which confirmed (1) the relatively low prevalence of decreased unilateral or bilateral fractional uptake in the whole population and (2) the lack of correlation between the prevalence of this sign and age.

I believe that whole-body thallium exercise scintigraphy has to play an important and growing role in the noninvasive detection of silent or subocclusive peripheral vascular disease and the evaluation of multifocal atherosclerosis. Normal distribution of thallium during exercise in the legs should be more precisely defined and quantified in larger populations. The performance of such a method clearly depends on this fundamental step, at least in its diagnostic applications.

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REPLY: Dr. Tellier states that asymmetry is a more specific sign of peripheral arterial disease than fractional thallium uptake on whole body imaging. This is true, but experience has taught us that the sensitivity and overall accuracy of the study is improved by adding other quantifiable measures such as fractional uptake. Bilateral disease causing a balanced reduction of flow is not rare and would be overlooked if one relied solely on the presence of asymmetry. I was disturbed by Dr. Tellier's finding that 54% of male patients with coronary artery disease who do not have claudication show interextremity thallium asymmetry. It would be important to know the degree of asymmetry. We have found that an interextremity symmetry ratio of ≤90% is a specific disease marker in asymptomatic older men. I agree with Dr. Tellier that the normal distribution of thallium in the legs following exercise should be studied in larger populations. However, anyone can easily and quickly generate a practice-specific normal data base that can be immediately applied to clinical practice.

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Fluorodeoxyglucose, Myocardial Perfusion and Myocardial Cell Death

TO THE EDITOR: The success of positron emission tomography (PET) in the clinical setting depends upon the credibility factor, i.e., the demonstration that the science behind cardiac PET is sound. Otherwise, PET will be slowed down by uncertainties.

Opie and Camici (*1*) wrote a provocative editorial in the August issue of *JNM* on myocardial blood flow, deoxyglucose uptake (FDG) and myocyte viability in ischemia. Bianco and Wilson also wrote an editorial (*2*) which is pertinent to several sections of the Opie and Camici editorial and is consistent with our experimental findings and with the work of others. I would like to discuss some of the controversial scientific points.

Myocardial Hibernation

This clinical entity, the most important indication for a cardiac PET scan, can be assessed with: PET and FDG, PET and ^{11}C-acetate, the stress/reinjection ^{201}Tl technique or with dobutamine wall motion echocardiography. As Opie and Camici state, and contrary to opinions by others, FDG does not measure the metabolic rate of glucose. In fact, as shown by Lear and Ackermann (*3*), FDG studies underestimate energy production when substrates other than glucose are being metabolized. FDG studies also underestimate energy production when glycolysis occurs. One must note that glucose and FDG may both have differences in affinity for the transmembrane sugar transporter and for hexokinase (*1*). Opie and Camici accurately state that crucial data linking glucose extraction and myocardial blood flow have been missing. Stanley et al. (*4*) showed that after 50 min of myocardial ischemia (blood flow = 40% of control) the rate of glucose uptake in swine did not change, although its extraction was significantly increased, regional blood flow was decreased and delivery of glucose was curtailed. Under these conditions, increased glycolysis is not related to glucose uptake but rather to accelerated glycogen breakdown.

Finally, the data from Bergmann's laboratory (*5*) indicate that FDG activity in reversible as well as in persistently dysfunctional myocardium is markedly variable. Therefore they recommend that ^{11}C-acetate rather than FDG should be used to detect dysfunctional but still viable myocardium in patients likely to benefit from coronary revascularization. The science behind the use of FDG for detecting viability and for predicting improvement after revascularization is in its infancy.