higher concentration of ^{210}Po existed in the bronchial epithelium, and especially in the segmental bifurcations, was not confirmed either by Hill (*2*) or by Rajewsky and Stahlhofen (*3*).

In discussing the Little and Radford paper, Holtzman (*4*) states that the "discrepancies are still not fully resolved either in the light of existing data or regarding some theoretical considerations." Recent studies by Kelly and Homburger (*5*) have shown no increase in the tumorigenicity of tobacco "tar" on mouse skin, even when the "tar" was supplemented with 1000 times the amount of ^{210}Po found in freshly prepared "tar." Alpha-emitting radioisotopes were found in both urine and feces, indicating that ^{210}Po was absorbed, as one would have expected for this and other components of the applied condensate. Stahlhofen calculated that the radiation in "hot spots" reported by Little *et al.* (*6*) accounts for only 8 rem a year—about 40 to 50 times less than the lowest dose of ^{210}Po used by Yuile *et al.* (*7*) to induce one bronchial squamous carcinoma and three adenomas in 132 rats.

These data led to the conclusion that, at present, it appears unlikely that ^{210}Po, in the amounts contained in cigarette smoke, plays a role in tobacco carcinogenesis.

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27 March 1969

Subclinical Malnutrition

In their article "Nutrition and learning" Eichenwald and Fry (*1*) state: "No methods exist to identify and quantitate the biochemical abnormalities of mild, moderate, and severe malnutrition." This statement overlooks recent surveys (*2*) in which circulating thiamine, biotin, riboflavin, pantothenate, nicotinate, vitamin B_6, vitamin B_{12}, folate, vitamin A, β-carotene, ascorbic acid, vitamin E, total cholesterol, and triglycerides were analyzed in 642 10- to 13-year-old New York City school children of Chinese, Puerto Rican, Negro, and Caucasian ancestry. Levels of thiamine, biotin, and ascorbate were markedly below the mean values for the total population in the cases where protein intake was inadequate. Circulating levels of these vitamins may be taken as a practical index of subclinical malnutrition. The results obtained with these methods are in excellent agreement with data derived from studies of clinical states involving vitamin imbalances (*3*).

Most methods used in these surveys are relatively new (*4*). They are practical for large-scale nutritional surveys for the detection of clinical as well as subclinical malnutrition. As has been pointed out (*2*), evaluation of clinical nutrition without laboratory evidence is a poor indication of nutritional adequacy when overt signs of nutritional deficiencies are absent. "Subclinical malnutrition" poses problems of detection, but it certainly does exist (*2*, *3*). Perhaps malnutrition resulting from multiple deficiencies is an everyday reality even in New York; while remaining clinically unapparent in some children, it may become manifest with age. Further studies are obviously needed.

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In their technical comment on our article, Baker, Frank, and Hutner apparently equate mild, moderate, and severe malnutrition with subclinical malnutrition. We do not agree with this idea; even though some cases of mild and even moderate malnutrition may be characterized as subclinical, severe malnutrition is manifested in overt clinical signs.

The primary emphasis in our article was on the relationships of protein and calorie deficiencies to learning and the biochemical processes of nervous tissue; little emphasis was placed on the relationship of vitamins, cholesterol, and triglycerides to these processes. The references cited by Baker, Frank, and Hutner are indeed valuable for their contribution toward the detection of below-average circulating levels of vitamins, cholesterol, and triglycerides in certain groups of children. These authors related the levels of these substances to either adequate or inadequate dietary protein intake. Our opinion remains that existing laboratory methods have not been sufficiently well established to permit one to distinguish clearly between individuals with mild, moderate, or severe malnutrition. Ratios of urea nitrogen to creatinine (*1*) and amino acid ratios in serum (*2*) may prove useful indices of protein intake, but more experience is needed to assess their validity. One of the more recent promising developments, which Baker *et al.* should examine, is the report from Ibadan (*3*) that changes in transferrin concentration were useful in distinguishing between cases of mild, moderate, and severe protein-calorie malnutrition.

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