Letters

Esophageal Cancer

Kmet and Mahboubi have done a fine survey on esophageal cancer in the Caspian littoral of Iran (25 Feb. 1972, p. 846). In their article, they make reference to the high incidence of esophageal cancer among the Bantu people living in the Transkei region of South Africa (*1*). It has now been shown (*2*) that the Bantu consume significant amounts of *N*-nitrosodimethylamine, a compound which has been shown to cause esophageal cancer in rats (*3*). The source of the *N*-nitrosodimethylamine is the juice of *Solanum incanum* fruit, which is used for curdling milk. It may be that the same carcinogen or a related one is present in the diet of the people of Iran, in the regions where a high incidence of esophageal cancer is found.

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The admirable study on esophageal cancer in the Caspian littoral of Iran is typical of the desperate searching for "real" causes of cancer in such factors as soil characteristics and rainfall patterns. Indeed, it may lead to some incredible hypothesis explaining why these specific 150 persons were the victims out of the usual 100,000 at risk.

My tone is critical, and is meant to be. Perhaps investigators biased toward the out-dated medical model of disease should review the series of letters in *Lancet (1)* about the scarcity of urinary tract calculi in people who speak Bantu. This trait crosses geographic, ethnic, and ecologic lines and adheres to a linguistic-cultural distribution. Further, it appears that speaking only Bantu is the thing to do if one prefers not to get multiple sclerosis. A study by Geoffrey Dean (*2*) indicated no reported cases of multiple sclerosis among the 11 million Bantu in southern Africa; the incidence among whites who spoke Afrikaans was 3 per 100,000, but among English-speaking whites it was 11 per 100,000.

I am not saying that the language is causative. Japanese women are noted for their fantastically low rate of breast cancer, but Japanese women who act, think, and talk as if they were American wives join the latter in their unusual predilection for breast malignancies.

Much of our thinking is modified by the nature of the language we learn, and distorted language is then reflected in inappropriate behavior. Such considerations, plus the infinite number of other observable and nonobservable factors in the total field lead to a more coherent, although still partial, picture of the individuals being studied. Psycholinguistic, postural, emotional, and all other known aspects of human behavior should be as carefully analyzed as the rainfall or the flora. Such things as malnutrition, "permanent pregnancy," constant breast feeding, and other catastrophic living conditions can then perhaps be evaluated in terms of the degree of depressive reaction that occurs when these individuals process their perceptions of so-called reality through the revealing-distorting lens of personal language.

Sooner or later, the complexities of subjective behavior must be breached; I wish the researchers would stretch their grant dollars to allow just *one* sincerely put question, in the cancer patient's own dialect: "How long were you miserable and unhappy and depressed and angry *before* you started to have trouble swallowing?"

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Leete suggests that nitrosamines may be responsible for the high rate of esophageal cancer noted by us in Iran. Nitrosamines as a possible etiological factor to be investigated in our joint study in Iran were discussed at meetings of the Advisory Committee on Environmental Carcinogens of the International Agency for Research on Cancer (IARC) which took place in June 1970 in Omaha, Nebraska, and in May 1971 in Teheran, Iran.

The main problem is to find satisfactory methods for analysis of *N*-nitroso compounds in complex and diverse materials such as foodstuffs, as the methods used in some earlier studies have proved to be not reliable. IARC is currently carrying out intra- as well as extramural research for the development and standardization of appropriate analytical methods.

In March 1973, a pilot environmental chemistry study including nitrosamine analysis will be started within the framework of our epidemiological study in the Caspian littoral of Iran.

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Hydrogen Embrittlement

In addition to the safety factors discussed by Thomas H. Maugh in his article "Hydrogen: Synthetic fuel of the future" (Research News, 24 Nov. 1972, p. 849), it must be kept firmly in mind that hydrogen degrades the mechanical properties of many structural alloys, a phenomenon referred to by metallurgists as "hydrogen embrittlement." Instances of hydrogen-induced failure in practical components and structural components are well documented in the engineering literature. The factors controlling hydrogen embrittlement are complex, and imperfectly understood. Nevertheless, it should be pointed out that under appropriate circumstances hydrogenated steels may fracture un-