EDITORIAL

AETIOLOGY OF CANCER

February 4 is designated 'Cancer International Day'. On this day last year, I was in a public place when I overheard two primary school teachers from Central Kenya arguing as to whether there was a suitable vernacular word to describe cancer. After prolonged and repetitive argument lasting over one hour, one of them suggested the word "*Kirumi*" which in English roughly translates as a "*curse*". His friend seemed to agree apparently for lack of better word. In reality, the two people were actually arguing about the cause (etiology) of cancer. The vernacular word is used to describe an illness which defies logical explanation, the equivalence of the English word, "idiosyncrasy" and is often a consequence of failure to observe the wish of a departed relative. This discussion between the two teachers reminded me of a scene in the fiction book *Through the locking glass* where Alice finds herself involved in a futile argument with Humpty Dumpty over the meaning of the word "glory". When Humpty Dumpty runs out of patience, he brings the argument to an abrupt end by exclaiming, "When I use a word, it means just what I choose it to mean, neither more nor less."

A recent search in the internet using Google on *cancer aetiology* yielded 8,400,000 results. After extensive review of literature, I formed the opinion that little is actually known about the topic. Indeed it confirms the often quoted saying, "the amount of published scientific literature on a topic is inversely proportional to what is known". Therefore why not just to say we do not know what causes cancer. A convenient safety-value for this dilemma is use of statistics. For example on the basis of statistics, women who never become pregnant during their reproductive years have slightly higher risk of developing breast cancer than those who become pregnant. Similarly, it is claimed that black women are at greater risk of suffering from cervical cancer. As one frustrated observer once remarked, "Statistics are like bikinis, what they reveal is interesting but what they conceal is vital". We are told that unhealthy lifestyles, bad eating habits, drinking of alcohol are contributory factors in cancer. No proof is given but for lack of better explanation, we take note, while not necessarily agreeing.

A popular belief is that cancers are caused by unstable molecules often referred to as "free radicals". These molecules cause mutation of cells which then divide without control. Any cell which replicate has the probability of mutating. Unless the mutant is killed through apoptosis or helper molecules (some DNA polymerases), the cells will multiply in a geometrical progression, a kind of chain reaction. In the presence of disruptive substances called carcinogens, these errors of mutation are self-amplifying. The carcinogens may also promote mutation of cells. It is on this basis that substances commonly referred to as "antioxidants" are promoted as cancer preventive agents. These substances are supposed to neutralize the supercharged free radicals. Antioxidants such as beta-carotene and vitamin E occur in common foodstuffs such as carrots, sweet potatoes, pumpkins, mangoes, spinach, kale. Whether antioxidants can prevent cancer or not is debatable but some well controlled clinical trials have failed to confirm these claims. Human beings survive on hope and will accept any information which promises to add an extra day to their lives. That is why educated people, including health professionals, will consult an illiterate herbalist who claim to cure cancer.

Several chemicals found in plants are implicated in aetiology of cancer. These include aflatoxins, pyrrolizidine alkaloids, nitrosamines and tannins. Nitrites commonly distributed in plants can easily be converted to nitrosamines. These substances have been found in beers and other plant derived beverages. Some unidentified chemicals in smoke from firewood commonly used by rural people are implicated in nasal pharyngeal cancer. Chewing tobacco and betel nut (widely chewed by Asiatic people) have been

implicated in cancer of buccal cavity. There is overwhelming evidence to implicate cigarette smoking in cancer.

In this issue of the journal, an article by Parimalakrishnan *et al.* discusses the cancer chemopreventive property of the plant *Biden pilosa* using antioxidant enzymes, lactate dehydrogenase and lipid peroxidase as biomarkers. Experimental results obtained with animal models have limited predictive value and cannot be extrapolated to explain possible effect in humans. Needless to say there are no animal models which can be used in research on breast cancer, ovarian cancer and prostate cancer. In the early 1960s, President J.F. Kennedy set out an ambitious project to find a cure for cancers. Thousands of plant species were screened for anticancer agents. Although some positive results have been achieved, overall the project has been a failure and currently the project has been downgraded. Simply stated, we do not know what causes cancer.

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