



CANCER

Studies in Boston revealed an association between adenosis or adenocarcinoma of the vagina in young women and a history of treatment of their mothers with diethylstilbestrol, a synthetic female hormone, during pregnancy. The hormone was given to the mothers because of abnormal bleeding during pregnancy or because previous pregnancies had aborted. This observation suggested that hormones may act not only to regulate function in the adult, but also to organize structural development in the embryo.

An important book by Israel Penn was concerned with the high risk of cancer among human kidney-graft recipients who are treated with immunosuppressive drugs over prolonged periods to retain the grafts. Penn's survey indicated that there was an increased risk of a wide variety of cancer types; the increase may exceed one hundredfold the incidence in the normal population. This finding provided further evidence for the view that an immunological surveillance system is an important defense against the development of cancer, and that the seeds of cancers are probably present in the bodies of many normal individuals but cannot grow so long as immunological defenses are intact.

An earlier discovery, in 1965, that certain tumours of the intestinal tract released a substance termed carcinoembryonic antigen (CEA), was applied to detection of cancer in 1971. A medical team at Columbia University developed a sensitive radioimmunoassay method for detecting CEA in serum. They detected the antigen in patients with a variety of cancers unconnected with the intestinal tract. Raised levels of CEA were also found in patients with ulcerative colitis, who are recognized to bear an increased risk of developing bowel cancer. Other workers, using a different assay method, found CEA in the serum of cancer patients with chronic liver disease or chronic kidney failure. Although CEA in serum could no longer be regarded as a specific test for cancer, many hospital laboratories were planning to test for

it on a routine basis, on the ground that its detection does have some diagnostic value.

The exciting discovery, reported independently by three researchers in June 1970, of the enzyme reverse transcriptase continued to revolutionize the concept of how certain viruses can give rise to cancer. The biological effects of a synthetic form of the enzyme were studied in many laboratories. The results were somewhat puzzling, however, since under some conditions the enzyme appeared to enhance the risk of tumour development in experimental animals, whereas under other conditions it exhibited anti-tumour activity.

Particles similar to type B mouse mammary tumour virus have been observed in human milk and in human mammary cancers for several years. It was reported that these particles contained reverse transcriptase activity (however, milks lacking the particles also lacked this enzymic activity). It was suggested that it would soon be possible to resolve, by molecular hybridization experiments, the relationship between the human type B particles and the similar agents associated with mammary tumours in mice and monkeys. It should also be possible to resolve many questions concerning the relevance of the particles to the development of breast cancer in humans.

In December 1971 a team of scientists in Los Angeles announced the isolation of a virus that might be implicated in human cancer. If the identification was substantiated by later work, this could prove to be of great importance in cancer research.

Workers in Italy reported the development of tumours of the skin, lungs, and bones in rats exposed for a year to vinyl chloride vapours. Also, certain ethers were found to be highly potent initiators of cancers in the nasal cavity and lungs of rats. The discovery of the potent carcinogenic activity of these widely used industrial agents will have important consequences in the field of occupational medicine.

Using new assay methods, several groups of workers found volatile nitrogen compounds (nitrosamines) in nitrite-preserved meats. It was not known whether the minute concentrations of nitrosamine found have significance in relation to any human cancer, but as with many food additives it must be held suspect. Other workers showed that nitrosamine may be formed in the stomach by the interaction of secondary amines, ingested as drugs or as food constituents, with nitrites added to foodstuffs as preservatives.

(F. J. C. R.)

A chain smoker lights another cigarette as a cash register in the background rings up the cost of potential lung cancer in a scene from a 1971 antismoking commercial commissioned for British television by the Health Education Council.