

FILE NAME: State of the Art Literature (SAL)

DATE: 1952

DOC#: SAL055

DOCUMENT DESCRIPTION: Excerpt - Encyclopedia Britannica - Cancer

ENCYCLOPÆDIA BRITANNICA

A New Survey of Universal Knowledge

Volume 4

BRAIN to CASTING



ENCYCLOPÆDIA BRITANNICA, INC.

CHICAGO · LONDON · TORONTO

COPYRIGHT

IN THE UNITED STATES OF AMERICA

**1929, 1930, 1932, 1936, 1937, 1938, 1939, 1940,
1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948,
1949, 1950, 1951**

1952

BY ENCYCLOPÆDIA BRITANNICA, INC.

**COPYRIGHT UNDER INTERNATIONAL
COPYRIGHT UNION**

**ALL RIGHTS RESERVED UNDER PAN
AMERICAN COPYRIGHT CONVENTIONS
BY ENCYCLOPÆDIA BRITANNICA, INC.**

Carcinomas of the breast and uterus have their greatest frequency in ages 45 to 65 and then decrease in relative frequency later. Malignant tumours of the connective tissues (sarcomas) occur with equal frequency in all decades of life, due allowance being made for the relative proportion of the various age groups.

Heredity.—It has been possible by selective breeding and inbreeding in mice to develop strains in which cancers of diverse histologic and regional types consistently appear throughout succeeding generations. In the human, the genetic tendency is usually dissipated through marriages in successive generations; the child may inherit the type of skin or the type of breast in which cancer is more prone to occur rather than to inherit the disease itself. As a rule, two factors are necessary: (1) the genetic background or susceptibility which is not constant for every variety of cancer; and (2) an inciting or causal factor which precipitates the onset of the cancer in the predisposed tissue. Occasionally, through chance breeding in which the genetic factors are magnified, the hereditary tendency becomes manifest. For example, in certain families, mothers, daughters and granddaughters have acquired cancer of the breast whereas in other families cancer of the stomach has been a common ailment. This familial distribution has occurred with too great frequency to be considered coincidental. Cancers of similar type and regional distribution have been reported in identical twins. Certain benign tumours are inherited, such as tumours of peripheral nerves, cartilaginous tumours or enchondromas, pigmented moles of the skin and polyps of the colon. Some of these inherited benign tumours may later undergo malignant degeneration. Glioma of the eye developing in childhood is definitely inherited. Xeroderma pigmentosa is a familial skin disease in which all protective resistance to the irritating action of actinic rays is lacking. For some unexplained reason in this inherited skin disease, those portions of the skin exposed to sunlight, notably the hands and face, inevitably develop cancers with death of the individual as the result, unless the subject becomes diurnal and emerges only at night.

Relation of Trauma to Cancer.—The origin of cancer can seldom be attributed to a single blow or trauma. The traumatic origin of cancer is a controversial medico-legal subject. In view of the thousands of serious war injuries and the innumerable bruises and lacerations occurring in civil life, including fractures of bone, with the rarity of cancers following in proper sequence after such injuries, it is illogical to assume that single trauma plays any important role in the causation of cancers. To accept the history of a single injury as the immediate cause of cancer, certain postulates should be fulfilled; namely, the definite evidence of injury, identical sites of the injury and the later developing cancer, a logical time interval between the date of the injury and the appearance of the cancer, the absence of a pre-existing tumour at the same site and, finally, a type of malignant tumour consistent with this mode of origin, such as a sarcoma of the structural framework; e.g., fibrosarcoma of connective tissue, liposarcoma and malignant synovioma arising from tendon sheaths.

An injury such as an extensive laceration or burn may result in a scar which in future years may change or degenerate into cancer. But the mechanism of the genesis of cancer under these circumstances is different from its reputed onset immediately following a single injury. Trauma does play a part in the development of some cancers of stratified epithelium found in the skin or mucous membranes of the oral cavity and oesophagus. But here the injury is repeated small traumas in the form of chronic irritation, sometimes daily for many years. Irritation of the tongue or mucosa of the cheek from ill-fitting dental plates, pressure of a hot pipestem on the lip, daily irritation of the oesophagus by swallowing hot wines and soups, are common examples of the type of chronic irritation as provocative causes of cancer in these locations. An exception to this statement is the common corn or clavus on the foot which rarely undergoes malignant degeneration.

A classical example is the frequent development of cancers of the cheek in Hindus who are addicted to the habit of chewing a mixture of irritating areca nut, betel nut and lime.

Occupational Cancers.—Occupational cancers can be definitely traced to external environment; in this respect they differ from other cancers, fortunately so because the causes are remedial. By mid-20th century, more than 20 inorganic and organic compounds had been recognized as capable of causing cancers in humans. The quantity of this agent may be so minute as not to cause apparent irritation during the time of exposure. The change is gradually induced in the tissues which ultimately become cancerous. The precancerous change may be so permanent that a malignant tumour may develop many years after the particular occupation has been abandoned. Roentgenologists, dentists employing X-rays for diagnosis, orthopaedic surgeons using fluoroscopy for setting fractures, and radium and X-ray technicians, through their exposure to radiant energy throughout the years, may injure their hands with resultant radiation dermatitis and ultimately X-ray or radium cancer. Workers in the dye industry exposed to aniline, benzidine or betanaphthyl in subsequent years develop papillomas and even cancers of the urinary bladder. Cancers of the respiratory tract involving the mucosa of the nose, the antral cavities, the larynx, the bronchi and lungs occur in workers who are exposed to the inhalation of chrome salts, asbestos dust and nickel carbonyl. Leukemia, a malignant tumour implicating the white blood cells and their formative tissues, sometimes develops in workers who have been exposed to benzol. Radium dial workers formerly painted the numerals on watches with radioactive metal paints and ingested this substance which was deposited in their bones with later development of bone sarcoma; this hazard and many others of course were removed after the discovery of the danger. Workers exposed to coal tar, crude mineral oils, crude paraffins, pitch and arsenical compounds may develop multiple cancers involving the skin, chiefly of the hands, arms and scrotum.

Precancerous Conditions.—Certain diseases occurring in various tissues have been recognized as potentially dangerous because of the occasional development of cancer on this background. This does not occur inevitably but develops with such frequency that the term "precancerous" has been applied to these diseases. An example is the presence of gallstones; the incidence of cancer developing in gall bladders containing stones is approximately 5%. On the other hand, 98% of patients having cancer of the gall bladder have had pre-existing gallstones, which is a strong argument for the relation of the two based on chronic irritation as a causative factor. Leukoplakia is a thick, white patch of mucous membrane involving any portion of the oral cavity such as the tongue, lip, cheek, floor of the mouth, palate and tonsil, or other mucosa-lined organs such as the male and female genitals and the oesophagus. Cancer of the type known as epidermoid or squamous cell carcinoma develops with some frequency in these locations on the basis of pre-existing leukoplakia. Syphilis of the tongue (glossitis) sometimes predisposes to the development of lingual cancer; in fact, 25% of all patients who have cancer within the oral cavity have had syphilis, which is a higher incidence by far than obtains in the general population. The mouth of the womb (cervix uteri), if badly scarred, eroded and chronically infected, often sequential to childbirth, is a favourite location for cancer subsequently to develop. Certain benign tumours are precancerous in varying percentages, such as benign adenomas of the thyroid gland, polyps of the colon, papillomas of the urinary bladder and the common pigmented mole of the skin. Radiation dermatitis in the skin, which is a chronic X-ray burn, occurs as an occupational hazard in roentgenologists and may also be a precancerous disease imposed by the injudicious use of X-rays of improper dosage for the treatment of acne and excess hair on the face; cancers of the skin in later years may develop on the basis of this radiation damage. Keratoses, or warty overgrowths of the skin, which occur in elderly people or those with oily skins, may degenerate into skin epitheliomas or cancers. Scars of wide expanse such as follow the healing of burns may degenerate over joints so that scar cancers develop. The scarred skin is lacking in oil glands, sweat glands and elastic tissue which normally protect the skin against irritation. The early skin grafting of burns lessens the incidence of scar cancers later. Certain types of mastitis or