



Victorian Cancer News

*A Quarterly News Letter issued by
the Public Education Sub-Committee
of the Anti-Cancer Council of Victoria*

No. 7 FEBRUARY, 1961

MICE PROVIDE CLUES FOR MEN

LEUKAEMIA RESEARCH IN MELBOURNE

Six thousand mice are being closely studied in a current anti-cancer research project in Melbourne in an endeavour to find out what goes wrong — and why — when human beings develop lymphoid leukaemia.

Financed by the Anti-Cancer Council of Victoria, this major research investigation (involving one of the most mysterious forms of cancer, and one which accounts for half of all cancers in children) is being carried out by Dr. Donald Metcalf, with the help of Dr. M. Ishidate, a distinguished Japanese research worker, and a team of three assistants. The project is housed in laboratories provided by the Walter & Eliza Hall Institute for Medical Research at the Royal Melbourne Hospital.

The questions Dr. Metcalf and his team are trying to answer concern the basic origins of this disease of blood cells. What goes wrong with the white blood cells which causes them to become malignant? It is hoped that the present studies on this colony of mice will provide at least some of the answers.

Mice have been chosen mainly because they are one of the few animal species in which lymphoid leukaemia is a common disease. In fact, mouse lymphoid leukaemia closely resembles the same disease in man.

Also, since mice multiply quickly and are comparatively short-lived, large numbers of them suffering from leukaemia can be studied over a number of years and through many generations.

THE MOUSE COLONY

The most meticulous care is taken of all mice in the colony. They are housed in specially constructed, well-ventilated tin boxes, each lined with clean sawdust to guard against "tick", and kept in two mouse rooms. The mice are supplied with tubes of fresh water, dog biscuits which contain all the necessary vitamins, plus

By Carlotta Kellaway

slices of carrot and lettuce twice a week to make their coats shine. All mice are examined twice a day.

Each of the 6,000 mice is numbered and each mouse costs about 10/- to £1 per year to keep. The pedigrees of all descendants of the original four mice flown from Boston are traced on a huge "Family Tree" pinned up in the laboratory.

Two thousand of the mice in the colony are of a special inbred strain, developed by Dr. J. Furth of Boston, and known as the AKR strain, of which 90 per cent spontaneously develop lymphoid leukaemia as they grow older. The AKR mice have an air-conditioner which keeps the temperature down to 70°

to 75° Fahr., and attendants keep the room quiet to ensure the greatest possible accuracy in blood counts.

Close inbreeding has resulted in all mice of this strain being practically identical, and since the young mice are almost sure to develop leukaemia eventually, they can be studied to ascertain what is going wrong in the period preceding the onset of the disease.

HORMONE FACTOR DISCOVERED

Twenty years ago Dr. Furth found that the removal of the thymus (a lymphoid organ located close to the heart) prevented the development of lymphoid leukaemia in mice. Other American workers have since shown that if the thymus is removed it is impossible to induce leukaemia in these animals by chemicals, X-rays or the mouse leukaemia virus.



A laboratory worker takes a blood sample from a leukaemic mouse.

A recent discovery made by Dr. Metcalf has filled in some gaps in the story. The thymus, he found, produced a hormone which stimulates the division of primitive cells into lymphocytes. **Through the indirect action of this hormone, the thymus appears to influence the occurrence of lymphoid leukaemia in the mouse.**

Much research was necessary to confirm the discovery.

The lymphocyte-stimulating factor (L.S.F.) was found in no other organ of the body apart from the thymus. And the removal of the thymus led to the complete loss of the hormone L.S.F.

In normal mice it was found that the thymic L.S.F. helped to stimulate the production of normal lymphocytes. But in the mice destined eventually to develop leukaemia there were higher levels of L.S.F. production leading to excessive multiplication of the white blood cells.

In human beings very high levels of L.S.F. have been found in people suffering from chronic lymphatic leukaemia and lymphosarcoma. Medical knowledge concerning the thymus is still far from complete and Dr. Metcalf's studies of its behaviour in mice may help to increase our understanding of this organ which is so vitally concerned in the development of leukaemia.

OTHER INFLUENCES IN LEUKAEMIA

In normal mice the white blood cells are subject to a number of regulatory mechanisms. In addition to the thymus, these influences include the adrenals and sex hormones.

Adrenal hormonal disturbances, Dr. Metcalf has discovered, are a feature of the pre-leukaemic period.

In mice of the A.K.R. strain, the adrenals are not functioning properly and are not producing cortisone, which normally exerts a restraining influence on the formation of white cells. Consequently the lymphocytes tend to divide much more rapidly.

Last year laboratory staff counted just how fast the lymphocytes in pre-leukaemic mice multiplied as a result of these hormonal disturbances. It was found that although the cells appeared normal in structure they were, in fact, dividing at a much faster rate than in normal mice. This excessive multiplication of cells appears to be related to the subsequent development of leukaemia in A.K.R. mice.

THE BIG QUESTION

Much has already been learnt of the principles of what goes wrong in lymphoid leukaemia.

Behind all the careful investigation — into hormonal disturbances, excessive multiplication of white cells, the possibility that a virus is attacking the thymus — is the ultimate WHY facing all those engaged in tracking down the basic origins of cancer.

WHY does a normal cell become cancerous, and WHAT is the basic difference between a normal and a cancer cell? So far no research worker has been able to find out.

Dr. Metcalf and his team believe that some of the answers may be found in research with this colony of mice. But they know, too, that only by the most painstaking investigation by many research workers inspired by optimism and faith will the secrets eventually be revealed.



The Council's Carden Fellow, Dr. Donald Metcalf, and Dr. K. Nakamura at work in the laboratory.

SEARCH FOR CAUSES OF LEUKAEMIA IN NEW ZEALAND

The causes of leukaemia are also being sought in New Zealand, according to a report in the Christchurch "Press." (31/12/60.)

For the past three years Dr. F. W. Gunz, of the Pathology Department, Christchurch Public Hospital, has been investigating the case histories of leukaemia patients in New Zealand, to try to trace factors which might be involved in the development of the disease.

Dr. Gunz, a guest of the Anti-Cancer Council at the Victorian Cancer Congress last year, said that his research suggested that radiation appeared to be of very little importance as a cause of leukaemia in New Zealand. Other things which had been suspected of influencing the occurrence of leukaemia, but for which he could find no evidence in his research, were contact with certain chemicals; family histories; and contact with other sufferers.

No families with a possible hereditary susceptibility to leukaemia had been found in New Zealand. As for contact with sufferers, Dr. Gunz stated that there is at the present time no convincing evidence that human leukaemia can be spread by infection. In some animals the disease could apparently be caused by viruses, but there was no direct evidence that a virus could cause human leukaemia.

In an endeavour to trace the cause of the over-production of white blood cells which is a characteristic of leukaemia, Dr. Gunz is now embarking on another research project, the examination of the nuclei of the cells of the bone marrow and other white-cell-producing areas. The nuclei will be examined for chemical abnormalities and for aberrations in the number of chromosomes in the cells.

To assist in this research, a special research fellow, Miss Angela Adams, has been appointed to work with Dr. Gunz by the New Zealand Branch of the British Empire Cancer Campaign. Miss Adams, a Dunedin biologist, is to visit Australia early this year for special study under Professor H. N. Robson of the University of Adelaide.

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SKIN CANCER IN VICTORIA

RESULTS OF HEALTH DEPARTMENT SURVEY

Cancer of the skin occurs more frequently in Australia than in any other part of the world. The reasons are known. The originating cause of skin cancer is the action of sunlight on the skin, and Australia is a land of sunlight.

Those parts of the world with most sunlight are occupied by dark-skinned peoples, as was Australia before the advent of the white man. Dark-skinned people are not susceptible to skin cancer produced by the ultra-violet rays of sunlight because the pigment melanin in their skin protects them. But the predominantly fair-skinned people who now inhabit Australia are inadequately protected against skin cancer since their skins contain little melanin.

Although it has long been known that the incidence of skin cancer in Australia is extremely high, it has not been established exactly how much there is. The available evidence has come from records of the numbers of persons seeking treatment. But there is no record of the numbers of people with skin cancer who do not seek treatment at all, and it is known that many persons, particularly the aged, do not worry about small skin cancers.

AIMS OF THE SURVEY

The Victorian Department of Health therefore decided to survey a sample of the Victorian community to find out just how many people in Victoria had skin cancer, treated or untreated, at the same time obtaining exact information as to the relative frequency of skin cancers in men and women, in dark and fair individuals, and at different ages. Such information is urgently desired by cancer research workers, as its analysis may provide some clues as to the origin of cancer.

The survey was undertaken by Drs. G. Read and G. A. Cook, of the State Health Department, the incidental expenses being met by the Anti-Cancer Council. The findings were analysed by Miss Cynthia McCall, of the Council's Central Cancer Registry. The results of the survey were presented at the Victorian Cancer Congress held in Melbourne in August, 1960.

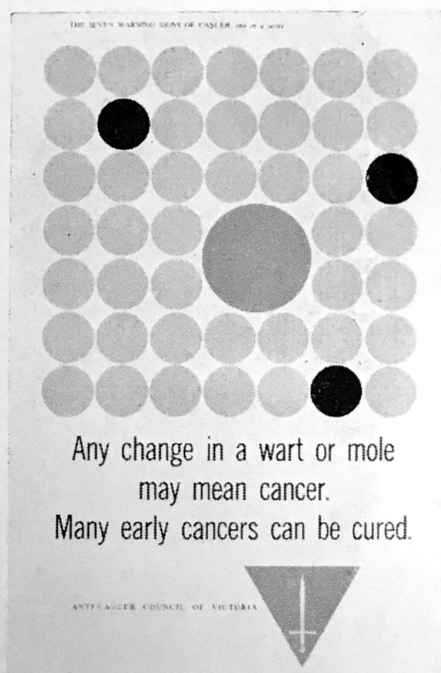
This short account is presented for the information of the many thousands of people in Victoria, including a large number of readers of "Victorian Cancer News", who helped to make this investigation a success.

RANDOM SELECTION

In a survey of this kind, a sort of Gallup poll in which only a small fraction of the population is examined, the people examined must be chosen at random. It is useless to ask for volunteers, because these might include an undue number of people suspecting they might have cancer. Nor is it practicable to examine only employees in industry or Government service, because the greatest incidence of skin cancer is in people over the age of sixty, many of whom have retired.

It was decided therefore to pick by lot a proportion of people on the electoral rolls in centres throughout the State, aiming at examining 5,000 people—about 300 to 400 persons in each of sixteen centres. Altogether 6,340 invitations were issued and 4,976 persons attended for examination. This overall attendance of nearly 80% was very satisfactory. It was achieved only by the co-operation of many public-spirited people throughout the State.

The invitations to attend the survey were issued by local Councils, who also provided accommodation for the medical examinations and made available the services of their Health Inspectors. The country Cancer Committees of the Anti-Cancer Council were of great assistance. The country press and radio stations gave welcome publicity to the survey, urging those invited to attend.



One of a Series of Posters issued by the Anti-Cancer Council.

The response was best in the country centres, and lowest in the cities. The record high attendance was at Colac, where 500 invitations were issued, and 461 persons attended (92%). The lowest response was in a Melbourne suburb, where only 203 attended of 401 invited (51%).

The response was almost 100% in people from 40 to 60 years of age, about 80% in those ten years younger or older, and only about 50% in those under 30 or over 70 years of age. Skin cancer is very rare in the young, so the poor attendance of this age group did not matter much. No doubt infirmity was the main cause of non-attendance in those over 70 years of age. Men and women attended in almost equal numbers.

FINDINGS

The number of persons with skin cancer among almost 5,000 examined was 280. Of these, 121 had untreated skin cancers, and 159 had received treatment. That is to say, that for every 4 known skin cancers in Victoria, there are 3 unknown cases for which medical advice has not been sought. This proportion of untreated to treated cases is about the same at all ages.

Of the 280 skin cancers found, exactly 100 were in women. Skin cancer is therefore nearly twice as common in men as in women. This is in accord with expectation, since women are less exposed than men to sunlight.

Skin cancer becomes increasingly common with advancing age. In this survey, 1 in 4 of all persons examined who were over 70 years old had a cancer of the skin, treated or untreated, whereas only 1 in 20 of those between 40 and 60 years of age were affected, and about 1 in 100 of those between 20 and 40 years of age.

INCIDENCE IN VICTORIA

From the data collected in this survey, it is estimated that about 100,000 persons in Victoria have cancer of the skin, and in about 40,000 cases the cancer is untreated. Many of these persons will, of course, eventually seek treatment, since in the survey the doctors were able to recognise many cases of skin cancer in its early stages, before the need for medical advice would be realised by the persons concerned.

Of the 40,000 people with untreated cancer, 30,000 have a mild form of skin cancer known as rodent ulcer. About 2,000 have cancer of the lip, a more serious form, which is common in men but rare in women.

Luckily, cancer of the skin is rarely lethal, unless badly neglected. In fact, only 20 persons died of the common forms of skin cancer in Victoria in 1958. In former years, however, the death rate was much higher.

It is still important to seek early medical advice when skin cancer is suspected, for two reasons. First, a rare form of skin cancer exists which is highly lethal. Secondly, treatment of an early skin cancer is a simple matter which will prevent subsequent discomfort and disfigurement.

A great deal more information was obtained in this survey than can be presented in this brief report. It is hoped that another survey will be conducted later to fill in some gaps in the information obtained, and plans for this are now under consideration.

Drs. Read and Cook have provided unique material for cancer research workers, and their findings will be of interest the world over.

COMMUNITY EDUCATION ON CANCER

ANNUAL REPORT OF THE PUBLIC EDUCATION COMMITTEE, 1960

INTRODUCTION

The Committee's activities in the education of the public regarding cancer entered a new phase with the appointment of a full-time Education Officer in September, 1958. The first months thereafter were occupied mainly in preliminary planning, and it was not until early in 1959 that the programme gained momentum. Since then, however, a continuous campaign has been waged to break down the barriers of ignorance and fear of cancer in the public mind. Now, two years later, the time is perhaps appropriate not only to report progress during 1960, but also to indicate some possible paths of future development.

LECTURES

Emphasis continues to be placed on the programme of lectures and/or film screenings for community organisations, and 232 such meetings have been held under the Committee's auspices in 1960, compared with 104 the previous year. The total attendance at these meetings has exceeded 8,300, and a further 2,000 people have attended a series of 16 talks in East Gippsland, arranged by the Regional Committee at Sale in association with sub-committees in the area.

Approximately one-quarter of all lectures have been given outside the metropolitan area, and speakers from Melbourne have visited such distant centres as Bendoc, Bright, Cohuna, Edenhope and Mildura.

The organisations addressed included Rotary, Apex, Jaycees, Branches of C.W.A. and Red Cross, Church Men's Societies and Church Women's Guilds, Parents' Associations, and many others. In some cases the meetings have been open to the public, but generally the audience has been limited to the members of the group addressed.

Lecturers have included members of the Speakers Panel formed in the metropolitan area, medical members of a number of the Country Committees, and the District Health Officers of the State Department of Health. The Committee wishes to express its thanks to the Department, the Chief Health Officer, Dr. K. Brennan, and the District Officers for their participation in the lecture programme.

"CANCER EDUCATION WEEKS" IN COUNTRY CENTRES

A major development during 1960 has been the extension of the Council's education programme to the country areas of the state, particularly the introduction of "Cancer Education Weeks." These "Weeks", sponsored and organised by the local Regional Cancer Committees, have proved exceptionally successful.

The activities have varied from Committee to Committee, but generally have included the organisation of public meetings, the door-to-door distribution of educational literature, the inclusion of 35 mm. cancer films in local theatre programmes, and the provision of re-

corded talks to local radio stations and of articles and news items to the local press.

The Regional Committees staging "Cancer Education Weeks" during the year have been those at Bendigo, Geelong, Hamilton, Horsham, Mildura, Sale, Shepparton, and Wangaratta. In addition, sub-committees at Ararat, Bairnsdale, Warracknabeal, Wodonga, and Yarrawonga have organised similar campaigns in their respective districts. A number of other sub-committees have also sponsored meetings and film shows.

It is estimated that at least 12,000 people have attended the public meetings held during these "Weeks" at the cities and towns mentioned.

It would be difficult to praise too highly the work of the Country Committees in organising and carrying through the educational campaigns in the various centres. Not only has their initiative, enthusiasm, capable direction and sheer hard work enabled the public education programme to become truly state-wide in scope, but this has been accomplished at a fraction of the cost of a centrally-organised campaign.

EXHIBITIONS AND DISPLAYS

Immediately prior to the Victorian Cancer Congress in August, a four-day Public Exhibition on the theme "Victoria Fights Cancer" was held in the Lower Melbourne Town Hall.

The Exhibition was viewed by between 7,500 and 10,000 visitors, and attracted much favourable comment both from doctors and laymen. The Director of the Museum of Applied Science, Dr. C. M. Focken, described it as "probably the best health exhibition ever mounted in Melbourne".

The Public Education Committee is most appreciative of the assistance rendered by the Cancer Institute Board, the Alfred Hospital, the Austin Hospital, Prince Henry's Hospital, St. Vincent's Hospital and the Melbourne District Nursing Service, and of the work of the individual exhibitors, whose joint efforts contributed so materially to the Exhibition's success.

Part of the Exhibition was later included in a display at the Melbourne Homes Exhibition in September. The display was located in a favourable situation and was viewed by many thousands of people.

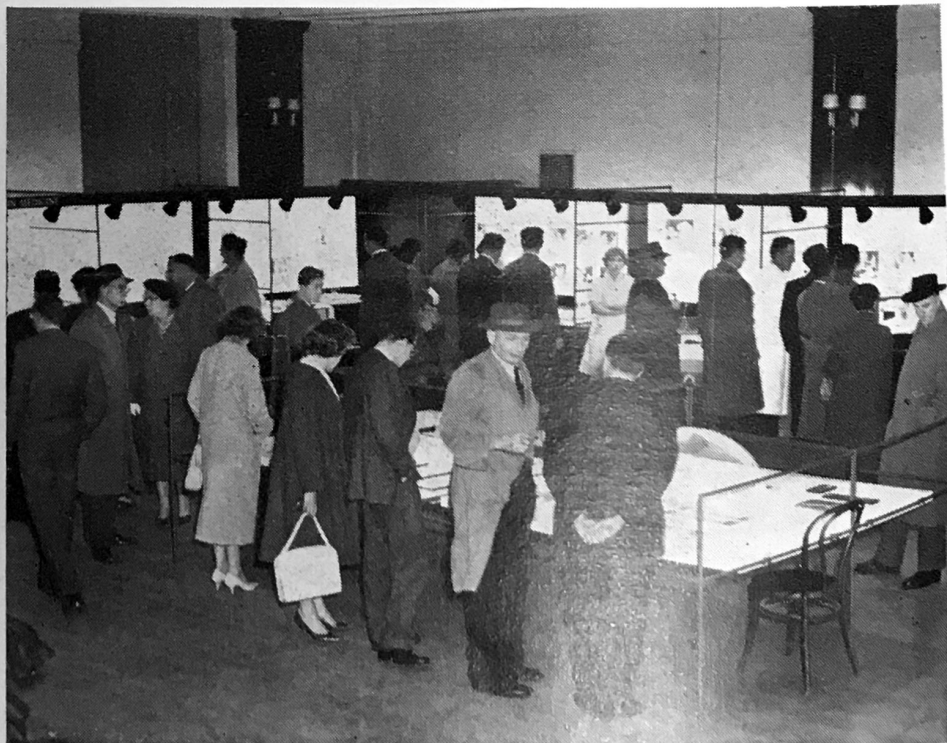
During the year the Committee's Portable Display was exhibited at Bendigo, Wonthaggi, Wangaratta, Cohuna, Geelong, Sale and Bairnsdale.

LITERATURE

Nearly 50,000 copies of the Public Education Committee's booklet, "What You Should Know About Cancer", have been distributed during the year, and a revised version has been prepared for 1961.

A similar number of copies of the leaflet, "Cancer Facts for You", have been distributed, the majority by Country Committees in the course of "Education Week" activities. The Geelong Regional Committee alone arranged for the door-to-door distribution of 20,000 copies.

A new booklet on "Cancer of the Breast", prepared during the year, is now available and is distributed to all women attending education meetings. A companion booklet on "Cancer of the Womb," is in course of preparation.



The Town Hall Exhibition.

The set of 7 posters, each describing one of the warning signs, is now on display in public transport in Melbourne. The sets have also been widely distributed through the State Department of Health and the Country Committees.

Four issues of the Committee's quarterly newsletter, "Victorian Cancer News", have been published during the year. Circulation has risen from under 1,000 to almost 2,000 per issue.

PRESS AND PUBLICITY

As always, the Anti-Cancer Council has had the most generous support for its work from the metropolitan and country press.

This year, with the extension of the education programme to the country, local newspapers throughout the state have co-operated to the fullest possible extent with the Country Committees. Whilst it is invidious to mention one newspaper when all have so willingly assisted, I must instance the "Border Morning Mail", which produced a four-page "Cancer" Supplement as its contribution to "Education Week" in the Wodonga district.

RADIO

Metropolitan and country radio stations have been equally helpful. At least eight stations have broadcast the set of recorded talks, prepared at the Committee's direction and supplied to the Regional Committees, generally in support of the local "Education Week", and often in peak listening hours.

Furthermore, many stations have made advertising time available either without charge or at a greatly reduced rate to publicise the local Committee's activities. It is a pleasure to take this opportunity to thank the managements of the stations concerned for their generous co-operation.

FILMS

The library of 16 mm. films maintained jointly by the Anti-Cancer Council and the State Film Centre now includes some 30 titles. Films have been screened at all "Education Week" meetings and at most group meetings.

Four public film screenings were arranged in conjunction with the Town Hall Exhibition, and together were attended by more than 1,000 people.

The State Film Centre has continued its policy of including cancer films in its general film programmes at regular intervals, as well as lending them to registered borrowers upon request. The Centre reports that there were 381 screenings of these films during 1960, with a total viewing audience of 29,480 persons.

35 mm. copies of "Man Alive", "The Other City", and "Traitor Within" have been obtained from the U.S.A. These have been included in the regular programmes at theatres and "drive-ins" in various country centres, usually during the local "Cancer Education Week". The co-operation of the proprietors of the theatres in question is greatly appreciated by the country committees and by the Public Education Committee.

RESEARCH PROJECTS

During the year two investigations into the effects of cancer education on the public were undertaken on the Committee's behalf.

The first, conducted by the University Department of Psychology, sought to determine public attitudes towards cancer and the effect of education on those attitudes. Preliminary information derived from the survey suggests that the campaign has already resulted in better knowledge of the warning signs, an increased awareness of the serious nature of the disease, and a slight increase in confidence in non-surgical methods of treatment. However, results as yet are incomplete and the investigation is continuing.

The second survey, an examination of the effectiveness of films in cancer education, was carried out by the University Department of Audio-Visual Aids. Investigation of audience reaction to selected films showed that a single film viewing could bring about positive changes in factual knowledge and improve viewers' attitudes to cancer, without producing any marked hypochondriacal tendencies. The Department's recommendations relating to the production and content of educational films for the public are being studied with a view to the eventual production of a suitable film with a Victorian or Australian theme.

FUTURE DEVELOPMENT

The programme of lectures and films for community organisations, which has been the basis of our campaign to date, will be continued in city and country in the coming year. More than 50 talks have already been arranged for 1961, and it is expected that the total may exceed 200 for the second year in succession.

"Cancer Education Weeks" in country centres will continue to be held. Arrangements for "Weeks" in the Warrnambool and Ballarat districts early in the year are now nearing completion, and others are under discussion. Regional Committees which have held "Weeks" this year will be encouraged to extend their coverage to smaller centres within their respective Regions.

Additional methods for extending the education programme in country areas will also be examined. Our experience at Sale and Bairnsdale this year suggests that some form of display or literature stall at Country Shows would bring many people within reach of this information who otherwise would remain outside the scope of our programme. Details as to the use of mobile information units for this purpose have been sought from the United Kingdom and the United States.

It is also proposed to examine means by which the programme could be brought to workers in business and industry. In the past year successful meetings were held at General Motors-Holden's Dandenong plant for office employees and at Foy's Bourke Street store for executive and sales staff, and it is hoped that more meetings of this type can be arranged in 1961.

CONCLUSION

In developing the public education programme, the Committee has sought on the one hand to make more widely known the warning signs which may indicate the presence of cancer, at the same time stressing the importance of early medical attention; and on the other to bring about a gradual reduction in the climate of fear and superstition which still clouds the public mind and prevents so many from seeking medical advice in time.

We can fairly claim that in the past two years at least some progress has been made towards the achievement of both objectives. The University surveys described above, despite their small scale, have indicated that public awareness of the warning signs is growing, and that fear and ignorance are no longer quite so prevalent as a few years ago. Nor has any evidence been adduced that the educational campaign as such has caused any measurable cancer-phobia.

The encouraging public interest in the campaign, evidenced by the voluntary attendance during 1960 of well over 30,000 people at functions organised by or on behalf of the Committee, strongly suggests that the people of Victoria are deeply concerned about cancer, are anxious to obtain accurate, factual information about the disease, and look to the Anti-Cancer Council to supply these facts.

A. J. BROWN,

Public Education Officer.

23rd December, 1960

APPENDIX:

COUNTRY PROGRAMME, 1960

1. "Education Weeks" were held at:—

BAIRNSDALE, BENDIGO, HAMILTON, HORSHAM, MILDURA (including MERBEIN and REDCLIFFS), SALE, SHEPPARTON, WANGARATTA, WARRACKNABEAL, WODONGA (including KIEWA, YACKANDANDAH, CHILTERN and TALLANGATTA), YARRAWONGA.

2. Meetings for the general public or for community organisations were held at:—

ANAKIE, ARARAT, BACCHUS MARSH, BENDOC, BOOLARRA, BRIGHT, BRUTHEN, BUANGOR, BUNYIP, CHARLTON, COHUNA, COWES, DANDENONG, DUNKELD, EDENHOPE, FERNTREE GULLY, FISH CREEK, FRANKSTON, GEELONG, GLENTHOMPSON, GUNBOWER, HAMILTON, HEYFIELD, HORSHAM, INGLEWOOD, INVERLOCH, LAVERS HILL, LEONGATHA, LILYDALE, LINTON, LUBECK, MACARTHUR, MAFFRA, MEREDITH, MININERA, MOE, MOOROOLBARK, MORNINGTON, MORWELL, MURTOA, NATIMUK, NHILL, OFFICER, PINE LODGE, POOWONG, QUEENSCLIFF, RAYWOOD, ST. JAMES, SALE, STANHOPE, STAWELL, STRATFORD, SUNBURY, SWANPOOL, TAWONGA, TECOMA, TOORADIN, TRARALGON, TYERS, UNDERA, WARRAGUL, WEDDERBURN, WERRIBEE, WHITTLESEA, WOODEND, WOODSIDE, YALLOURN.

CATALOGUE OF ANTI-CANCER FILMS

AVAILABLE FROM THE STATE FILM CENTRE
AND ANTI-CANCER COUNCIL OF VICTORIA

THE BATTLE AGAINST CANCER. (S.F.C.)
16 mm. B. & W. 12 mins. 1947.

Produced by the American Cancer Society.

Prepared for lay audiences from a Swiss medical film; this film states that in any typical large group of Americans, one in every eight will die of cancer. To combat the high mortality caused by cancer, early treatment by X-ray, radium or surgery is essential. Microscope-slides are used in this film to show normal cell division and growth, contrasted with the abnormal and uncontrolled growth of cancer, and its invasion of normal tissue.

(N.B.—Film now somewhat out of date.)

BREAST SELF-EXAMINATION. (A.C.C., S.F.C.)
16 mm. Colour. 16 mins. 1950.

Produced by Audio Productions for the American Cancer Society. Designed for screening to adult women, nurses, medical students and physicians. It is recommended that a doctor be in attendance at all screenings to introduce the film and answer questions. The film encourages women to adopt a simple method of breast self-examination as a regular health habit. A live model is used to explain the steps women can follow in such an examination. Explains that if breast cancer was suspected earlier by women themselves, 80% of patients could be saved by surgery.

CANCER. (A.C.C.)
16 mm. Colour. 12 mins. 1953.

Produced by Encyclopaedia Britannica Films.

Describes the causes and symptoms of cancer, shows how cancers are identified and located, and discusses the use of X-ray and surgery in the treatment of the disease. A case history of a cancer patient is used to illustrate aspects of diagnosis and treatment.

CANCER: A RESEARCH STORY. (S.F.C.)
16 mm. Colour. 28 mins. 1953.

Produced by Dephore Studios for the American Cancer Society. Illustrates the story of the American Cancer Society's basic research in cancer. This seeks to discover the causes, cures and controls of the disease. The narration is by the former Medical and Scientific Director of the Society, Dr. Charles S. Cameron. (Censorship Restriction: The Commonwealth Film Censor has ruled that this film is to be screened only to members of the medical and nursing professions, and students of these professions, or to lay audiences when a doctor is in attendance.)

CANCER IS YOUR PROBLEM. (A.C.C.)
16 mm. B. & W. 15 mins. 1954.

National Film Board of Canada.

The subject of the film is an interview by a TV announcer with cancer specialists at a Montreal Cancer Clinic. It answers many of the questions commonly asked by the public. Methods of diagnosis and treatment, and research projects, are demonstrated and explained by the doctors interviewed.

CANCER QUEST. (S.F.C.)
16 mm. Colour. 28 mins. 1954.

American Cancer Society.

Through the experiences of a cancer patient and her husband, the film depicts the basic research projects conducted at McArdle Memorial Laboratory, University of Wisconsin. Shows investigations into the growth of normal tissue; similarity between growth stimulated by estrogen and growth in cancer tissue; change from normal tissue to cancer studied through azo dye effects; effect of nutrition on the incidence of cancer, conversion of food into energy, and cell structure.

CHALLENGE: SCIENCE AGAINST CANCER. (A.C.C., S.F.C.)
16 mm. B. & W. 36 mins. 1950.

Produced by the Canadian National Film Board.

To explain the enormous complexity of the problem of cancer the film traces briefly the biological growth of the human body as a process of cell division, and asks why some outlaw cells resume growth after the whole body has reached maturity. Research scientists are shown following up clues with test tube, microscope, experimental animals, and other aids that may lead to the eventual solution. Methods of treatment being used meanwhile for different types of cancer are briefly described. As each new aspect of the disease is revealed, the secret of cancer is seen to be as complex as the universe itself, and the quest for its solution one of the greatest adventures on which a scientist can embark.

CRUSADE. (S.F.C.)
16 mm. Colour. 11 mins. 1951.

Produced by Frank Donovan for the American Cancer Society.

Describes the three-fold program of the American Cancer Society; depicts the volunteer effort to save lives through education and to give help to the cancer patient in service; and discusses the hope for the future of the national research program. Narration by Spencer Tracy.

A DOCTOR SPEAKS HIS MIND. (S.F.C.)
16 mm. B. & W. 22 mins. 1949.

Produced by the American Cancer Society.

Prepares the way for a medical speaker. The featured character is a general practitioner who is deeply concerned because so many of his patients come to him when it is too late for him to be of help. It does not give the audience the medical and scientific facts of cancer, but stimulates their interest so they will be eager to learn the facts from the speaker who follows.

THE FIGHT: SCIENCE AGAINST CANCER. (A.C.C.)
16 mm. B. & W. 21 mins. 1951.

Produced by the Canadian National Film Board.

A progress report on the fight against cancer. The cancer cell, a tiny pinpoint of life, is the target against which a whole battery of scientific research is levelled. The film traces, in greatly magnified sequences, development of a single fertilized cell into an adult man, and asks why, after maturity, some outlaw cells begin a persistent and subversive growth of their own. (This film is a shorter version of "Challenge: Science against Cancer".)

FROM ONE CELL. (A.C.C., S.F.C.)
16 mm. Colour. 13 mins. 1950.

Produced by Sturgis-Grant Productions for American Cancer Society.

A special purpose film, prepared for classroom use. The subject of cancer is introduced objectively and unemotionally as one of the basic phenomena of growth. The picture is distinguished by especially developed time-lapse sequences, showing highly magnified specimens of normal and abnormal living tissue, which are unique in a teaching film.

HORIZONS OF HOPE. (A.C.C., S.F.C.)
16 mm. Colour. 18 mins. 1954.

Produced by John Sutherland Productions for the Alfred P. Sloan Foundation. Awarded the Golden Reel Award of the Film Council of America, 1955.

Animated and live-action sequences are used to describe the research programme at the Sloan-Kettering Institute for Cancer Research, New York, where scientists are investigating methods of curing disseminated cancer. Animation throughout vividly dramatizes highly technical aspects of cancer research. Recommended.

THE HUMAN CELL AND THE CYTOTECHNOLOGIST. (A.C.C.)
16 mm. Colour. 22 mins. 1957.

Produced by Churchill-Wexler Film Productions. U.S.A.

Basically a "careers" film showing the duties of a cytotechnologist, but excellent animation sequences providing basic information about the cancer cell and its spread within the body make it a useful film for general audiences. The daily routine of the cytotechnologist, preparing slides for microscopic examination, etc., is described.

JUST BY CHANCE. (A.C.C.)
16 mm. B. & W. 27 mins. 1958.

Produced by John F. Becker for American Cancer Society.

This is the true story of a Georgia-Alabama Valley—of how several disconnected events occurred, resulting in a showing of the film "Breast Self-Examination", and of how 900 women went to see the film. Of the 900, 27 found lumps in their breasts. Of the 27, eight had cancer. Ruth Hussey tells the story in warmly human terms as the cast of actual people, saved from cancer, go about their daily work.

LEASE OF LIFE. (A.C.C., S.F.C.)
16 mm. B. & W. 4 mins. 1959.

Produced by the State Film Centre for the Cancer Institute Board of Victoria.

Shows the 4 million volt linear accelerator now in use in Victoria for deep X-ray therapy to cancer patients. Tells the story of a woman who is restored to health by this form of treatment.

THE LINEAR ACCELERATOR. (S.F.C.)
16 mm. B. & W. 12 mins. 1954.

Produced by Hales and Batchelor Cartoon Films Ltd., for Educational Foundation for Visual Aids.

Introduces the theory of nuclear transmutations and the production of hard X-rays with laboratory-accelerated particles. Shows the development of equipment and techniques from the original Cockcroft and Walton experiments up to the most recent wave linear accelerator. A 4 ME V linear accelerator is shown in action at the Newcastle General Hospital where it is used for the treatment of malignant tumours.

(N.B.: A highly technical film.)

LIVING INSURANCE. (A.C.C.)
16 mm. Colour. 14 mins. 1954.

American Cancer Society.

Stresses the importance of the periodic detection examination. The story is persuasively told in both human and medical aspects. Accentuates the American Cancer Society's message—"Every doctor's office a primary detection centre for Cancer".

MAN ALIVE. (A.C.C., S.F.C.)
16 mm. Colour. 12 mins. 1952.

Produced by U.P.A. for American Cancer Society.

A cartoon film which deals amusingly with the psychology of worry, and shows how lack of knowledge affects a person's judgment in various ways, whether the worry is caused by a faulty car engine or an upset stomach. Designed to influence the layman's attitude to cancer. Recommended.

146,000 COULD LIVE! (S.F.C.)
16 mm. B. & W. 28 mins.

Produced by the American Cancer Society.

A kinescope of a programme originally presented on television. Presents dramatically each of the seven danger signals for cancer: five are represented by people cured of cancer; one by a woman who lost her son to cancer; and one by a man who noticed a danger signal, but found when he went to a doctor that he did not have the disease.

- THE OTHER CITY.** (A.C.C., S.F.C.)
16 mm. Colour. 22 mins. 1957.
Produced by John F. Becker for the American Cancer Society.
Racine, Wisconsin, U.S.A., a city of 75,000 inhabitants, appears as a deserted city. Thus the film dramatises the tragedy of the 75,000 needless deaths from cancer each year in the United States. The cases of seven people, each with one of the warning signs of cancer, illustrate the benefits of prompt medical examination. Objective, documentary style of presentation and use of analogies with nature to illustrate basic processes of cancer growth make this a very effective film. Recommended.
(Also available in 11 min. version.)
- OUTLAW WITHIN.** (A.C.C.)
16 mm. B. & W. 11 mins. 1951.
Produced by Canadian National Film Board.
A condensed version of "The Fight: Science against Cancer". (q.v.)
- A QUESTION IN TIME.** (A.C.C.)
16 mm. B. & W. 22 mins. 1949.
Produced by Transfilm for the American Cancer Society.
Aims to "substitute" for a medical speaker. Asks and answers those questions about cancer most commonly addressed to speakers by lay audiences. The theme is that adults, as well as children, can let their imagination lead them astray; but fear can be dispelled with proper knowledge.
- QUIET CRISIS.** (S.F.C.)
16 mm. B. & W. 10 mins. 1952.
Produced by New Zealand National Film Board.
A dramatized story of a typical cancer case. This film is a plea for an early visit to the doctor by anyone having the slightest suspicion of the disease, since with early treatment by present methods cancer may often be cured, while delay can prove fatal.
- REPORT ON CANCER.** (ON ORDER)
16 mm. B. & W. 23 mins. 1959.
Produced by Canadian National Film Board.
A fascinating area of exploration at any time, medical research into the cause and cure of cancer is making some striking advances. The film discusses some of these recent advances, and describes exciting discoveries revealed by new radiation techniques. The theory that cancer may have its beginning with a virus is also discussed. Present methods of treatment, including special instruments utilising radio-isotopes, are shown.
- SAPPY HOMIENS.** (A.C.C., S.F.C.)
16 mm. Colour. 7 mins. 1956.
Produced by U.P.A. for the American Cancer Society.
The cartoon character, Sappy Homiens, learns how cancer can be combated by knowledge of the early warning signs and regular physical check-ups. Places emphasis on the importance of early diagnosis and treatment.
- THE SCOULER CASE.** (ON ORDER)
16 mm. B. & W. 13 mins. 1960.
Produced by Canadian National Film Board.
The film describes how volunteer workers at the Princess Margaret Hospital, Toronto, ease the patient's road to recovery and free the regular staff for more technically demanding work, by looking after the comfort of patients. This is discovered by Harry Scouler, who comes to the hospital for cancer treatment.
- SKIN DEEP.** (A.C.C., S.F.C.)
16 mm. Colour. 10 mins. 1959.
Produced by Tasmanian Government Film Unit.
A dramatized story of a typical patient attending the Peter MacCallum Clinic in Launceston, Tasmania. The film is a plea for an early visit to the doctor by anyone having a possible symptom of cancer. Shows that with early treatment by modern methods, many cases of cancer can be cured. Illustrates the cobalt "bomb" in operation at the Clinic.
- TIME AND TWO WOMEN.** (A.C.C.)
16 mm. Colour. 15 mins. 1958
Produced by American Cancer Society.
A direct and moving presentation of cancer of the uterus and cytology, emphasizing the curability of this disease. Dr. Joe V. Meigs is featured; he dramatizes the case histories of two women—one whose cancer was discovered too late and one who was saved because of early detection and prompt treatment.
(N.B.: It is recommended that this film be shown only where medical facilities exist for conducting uterine smear tests.)
- TIME IS LIFE.** (S.F.C.)
16 mm. B. & W. 19 mins. 1947.
Produced by the American Cancer Society.
Describes possible symptoms of cancer, and the importance of seeking medical advice. A woman suspects that she has cancer and (as sometimes happens) does not dare go to a doctor, fearing above all that the suspicion will be confirmed. However, after a talk with a representative of the American Cancer Society, she takes the more rational course and has an examination, with negative results.
- TO SAVE THESE LIVES.** (A.C.C.)
16 mm. Colour. 11 mins. 1956.
Produced by American Cancer Society.
Prepared primarily to help the American Cancer Society's local education chairman build a well-balanced and well-trained educational organization; aimed particularly towards the recruitment of public education volunteers. A portrayal of the seriousness of cancer as a community problem and the great importance of intelligent, well-guided team-work in fighting it.
- TRAITOR WITHIN: CANCER.** (A.C.C., S.F.C.)
16 mm. Colour. 10 mins. 1947.
Produced by John Sutherland for the American Cancer Society.
An animated film which describes the process of cell growth, the lawless multiplication of cancer cells, their spread through the lymph and blood streams, and the possibilities of controlling and curing cancer by early diagnosis, and the use of surgery, X-ray and radium in treatment.
- THE WARNING SHADOW.** (A.C.C.)
16 mm. Colour. 16 mins. 1953.
American Cancer Society and U.S. Dept. of Health, Education and Welfare.
A documentary to fight the rising threat of lung cancer. Designed to persuade adults to have regular chest X-rays. Though aimed at men's groups, it can be shown effectively to mixed audiences.
- WHAT IS CANCER?** (S.F.C.)
16 mm. Colour. 25 mins. 1949.
Produced by Audio Productions for the U.S. National Cancer Institute and the American Cancer Society.
The main purpose of the film is to show that nurses have a vital role in the fight against this disease. Obviously, the nurse cannot do her part effectively unless she knows the basic facts. Prepared specifically for the nursing profession, the film covers the biological, statistical and therapeutic aspects of cancer.
- WHITE FORTRESS.** (S.F.C.)
16 mm. B. & W. 10 mins. 1949.
Produced by Canadian National Film Board.
A glimpse of what Canada's National Health Programme means in terms of human life and happiness. To people like Alice, who suspects she may have cancer; Lucille, a crippled child; and Otis, who lives too far from a doctor to find out what causes his many pains, the Health Programme provides the means of investigating their troubles and, where necessary, helping with treatment.
- MEDICAL USES OF ATOMIC ENERGY**
Selected films.
- ATOMS FOR HEALTH.** (A.C.C.)
16 mm. B. & W. 12 mins. 195-
Produced by L. A. Handel for U.S. Atomic Energy Commission.
Thanks to atomic energy, entirely new methods of diagnosis and treatment are being developed in Medicine. This picture shows two exciting illustrations: A new diagnostic test of a patient's liver which was made possible through the use of an atomic tracer, and a demonstration of a new cobalt source, the "Theratron," one of the radiation weapons in science's fight against cancer. We follow the case histories of two patients at Los Angeles Medical Centre.
- ATOMS FOR PEACE: PART I—INTRODUCING THE ATOM.** (S.F.C.)
16 mm. B. & W. 20 mins. 1955.
Produced by United States Information Agency.
This film provides a basic explanation of atomic energy by means of animated sequences. It shows the atomic pile at Los Alamos and the preparation and storage of radio-isotopes at Oak Ridge. It touches on the uses of atomic materials in medical research, agriculture and industry. The film's ending includes excerpts from President Eisenhower's speech before the United Nations emphasising America's hopes and desires for international control of atomic energy dedicated to human welfare everywhere.
- ATOMS FOR PEACE: PART II—MEDICINE.** (S.F.C.)
16 mm. B. & W. 20 mins. 1955.
Produced by United States Information Agency.
This film concentrates upon the uses and potential of atomic materials in medical research and diagnosis. One illustration is of a patient suffering from a brain tumour; another shows the use of radio-active materials as tracers in the detection and location of disease. It stresses the importance of the international interchange of scientific information and the potential of atomic energy in terms of improvement in the health of the world.
- OUR FRIEND THE ATOM.** (S.F.C.)
16 mm. Colour. 60 mins. 1957.
A Walt Disney Production.
Traces the development of knowledge about the atom from Democritus to the present day, with discoveries of Dalton, Becquerel, the Curies, Rutherford, Einstein and others. The fable of "the Fisherman and the Genie" is introduced to parallel man's initial fright and then his control of atomic energy. This provides a context to examine some of the basic facts of atomic structure and the theory behind fission, the atom bomb and the nuclear reactor. The manufacture and use of isotopes is also treated in some detail. The film has three wishes from the atomic "genie"—(1) Power, (2) Food and Health, (3) Eternal friendship with our friend the atom for creative rather than destructive uses.
- THE DISCOVERY OF RADIUM.** (S.F.C.)
16 mm. B. & W. 28 mins. 1956.
Produced by Columbia Broadcasting System.
A dramatisation of the discovery of radium by Pierre and Marie Curie. Henri Becquerel, a French scientist, whilst studying uranium discovers properties hitherto unknown to the scientific world—the substance emits rays that can penetrate black paper and leave an impression on a sensitive photographic plate. After intensive research the Curies discover the source of the rays—the previously unsuspected radioactive element radium. Realising the significance of the discovery, the novelist Jules Verne sees the fantastic possibilities ahead.
Films listed are available without charge to community organisations for non-commercial screenings. Titles marked S.F.C. may be borrowed from the State Film Centre, 110 Victoria Street, Carlton, N.3. Borrowers are requested to obtain and complete a "Borrowers' Application" form from the Centre, and to sign an undertaking to observe the library conditions of loan.
Titles marked A.C.C. are held by the Anti-Cancer Council of Victoria, 410 Albert Street, East Melbourne, C.2. For details regarding the availability of these films, and also of speakers on the subject of cancer, write or telephone the Public Education Officer at this address (FB 1386).

NOTES ON THE HISTORY OF CANCER

By A. J. Brown

1. CANCER IN ANTIQUITY

NATURAL HISTORY

Growth is a characteristic of life—human, animal and vegetable—from beginning to end. Usually we think of growth as implying an increase in **size**, but in the strict biological sense it is really an increase in the **number** of cells which go to make up the organism, and hence enlarge its dimensions.

In man, the process of growth is most pronounced during the period before birth. In these nine months the human embryo grows from an almost weightless single cell to a fully-formed individual weighing some seven pounds and consisting of many billions of cells. Moreover, the descendants of the original cell have assumed various distinctive features in order to form skin, muscle, bone and other tissues and organs.

Cell division continues at a reduced rate during childhood and adolescence, and after the 18th year slows down even further. However, it still continues, serving to replace worn out or damaged cells.

For reasons not as yet clear, certain cells may escape this orderly pattern of growth, and proceed to divide more or less rapidly without regard to the body's requirements. In time this unregulated cell growth produces a lump or tumour.

Many tumours, such as warts and cysts, consist of cells which, although multiplying in excess, remain in a well-circumscribed community and do not spread beyond a limited area. Because they do not endanger life, they are said to be benign.

Other tumours, however, are not limited in their growth in this way. Their cells may infiltrate surrounding tissues, where they crowd out and destroy normal cells. Or they may invade the blood stream or lymph channels, and be carried to distant parts of the body, there to lodge and initiate new growths. This type of tumour—because its cells continue dividing indefinitely, unless brought under control by proper treatment, until the death of the host supervenes—is called malignant, or cancer.

PREHISTORIC TIMES

Since cancer may thus be defined as a process of abnormal cell growth, scientists have conjectured that it is as ancient as life itself. "When some change in the early ocean led free-floating amoebas to cluster and become dependent upon one another for specialised service, then cancer first appeared on the earth. For one cell of the cluster must often have become more insistent for nourishment than its neighbours and crowded them to death."

Certainly there is no lack of evidence to prove the wide geographical and zoological distribution of cancer in the

remote past. Cancerous tumours have been discovered in the fossilised bones of dinosaurs of the Mesozoic era (dating back some 70 million years) found in the United States, and in those of Pleistocene mammals found in the caves of southern Belgium.

Nor were man's earliest known ancestors immune from cancer. A thigh-bone of *Pithecanthropus Erectus* dug up in Java in 1891 contained on its upper end a large bony tumour. The exact age of the specimen cannot be determined, but it is thought to be between 500,000 and 800,000 years old.

However, despite its world-wide occurrence, it is unlikely that cancer was a common disease of mankind in prehistoric times, for the expectation of life was such that few men or women could have survived to the so-called "cancer age".

ANCIENT EGYPT

Our earliest written records of cancer are to be found in the papyri of ancient Egypt. The oldest of these, the Edwin Smith Surgical Papyrus, parts of which are thought to have originated as early as 3000-2500 B.C., includes a description of a series of eight cases of tumours or ulcers of the breast. For "protuberant tumours," says the ancient writer tersely, "there is no treatment," but for others he suggests cauterization with a fire drill.

The Ebers Papyrus, written about 1500 B.C., is filled with magical formulae, symbols and incantations as well as physical remedies to be used in the treatment of various ailments. Yet mixed with these are descriptions of symptoms and methods of treatment showing that the priest physicians realised the value of a physical examination of their patients.

Practical instructions for palpating swellings or tumours are given, and a case of malignant disease of the womb is clearly described.

Archaeologists exploring the tombs of the Pyramids have discovered a num-

ber of mummies whose bones show unmistakable evidence of the onset of cancer. Surprisingly, no case of cancer of the soft tissues has yet been found in an Egyptian mummy, although this may be explained by the relatively limited number which have been medically examined.

OTHER ANCIENT CIVILIZATIONS

Other proofs of the antiquity of cancer are to be found in Etruscan tombs, Peruvian mummies, the cuneiform clay tablets of the great library of Nineveh, and the Sanskrit documents of ancient India.

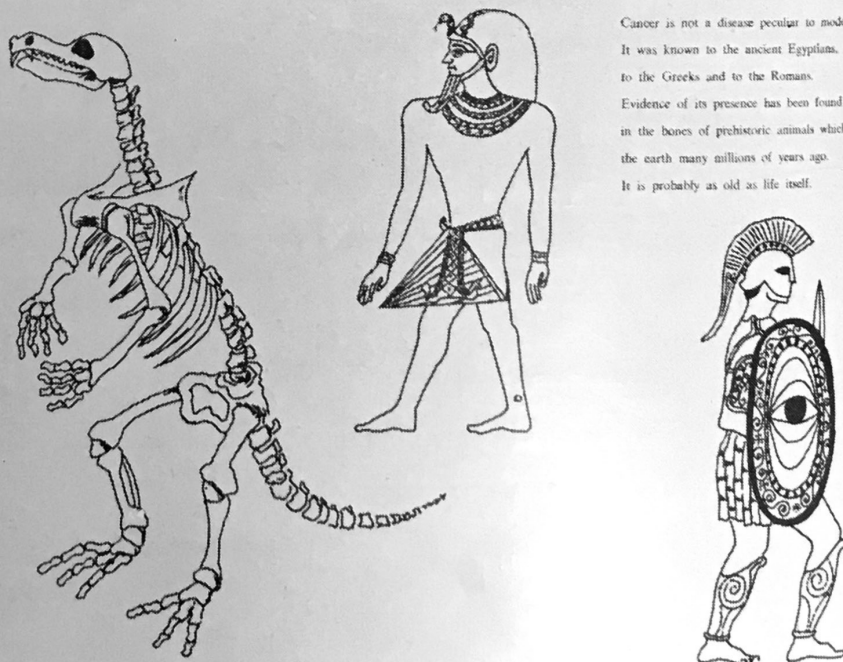
One of the earliest reported malignant tumours of antiquity was unearthed in 1893 during the excavation of an Etruscan tomb in the ancient city of Tarquinii. The tumour, affecting the lower end of the femur of an Etruscan skeleton, was examined and verified by Virchow and other eminent pathologists and surgeons visiting Rome in connection with the XIth International Congress of Medicine.

Examples of cancer of the bone have also been found in skeletons disinterred from prehistoric sepulchres along the Pacific coast of South America. The exact date of burial is not known, but certainly preceded the Spanish Conquest.

Although our knowledge of ancient Indian medicine is scanty, it appears that the Hindu physicians were conversant with many of the characteristics of cancer. The injunctions of the great physician and surgeon Susruta, who lived about 400 A.D., are not without value even today.

Thus he advises that "in the tumours which appear curable, the following should not be selected for treatment: those which have spread to vital regions, and those which if they are fixed and have arisen in Srotas (i.e., 'channels' such as the mouth, eyes, ears, etc.)." Recommended treatments included corrosive ointments containing oxides of arsenic and the use of the cautery or the knife.

(To be continued in next issue)



The Antiquity of Cancer — detail of a panel in the Town Hall Exhibition.