# The War Against Cancer

By John W. S. McCullough, M.D. D.P.H., Chief Inspector of Health, Ontario

In the campaign against cancer many things must be considered such, for example, as centres for treatment, delay in diagnosis, follow-up of cases, methods of prevention, and research.

Centres for treatment-In most of the countries of North America and in Europe, there are centres for cancer treatment with well-equipped staffs of pathologists physicists, physicians and surgeons, all trained to carry on their work with the closest cooperation. Cancer work has become team work. It is no longer the work of the general practitioner; it has become a highly specialized branch of treatment.

Delay in Diagnosis-In every country there is a

mentable complaint that most of the cases of cancer come too late for effective results in treatment. This situation is being met abroad by well-trained campaigns of public education and by better training of medical students and of those proposing to specialize in cancer work. Follow-up of Cases-

Another matter of importance is the follow-up of cases. In every clinic an elaborate record of cases should be taken to keep in touch with patients and to bring them back to the place of treatment at in tervals for years until all possibility of the return of the disease is past. In some countries the expense of transportation is borne either by the government or by the local authori

Prevention in Cancer-

Prevention in cancer is as necessary as prevention in other diseases Much can be done in this direction by education and by periodical examination of persons after 35 years

Advance in Cancer Control-

During the last century medicine has won signal victories over many diseases. Most of the victories have been in connection with germ-caused diseases. Cancer is a disease of an other category. Its actual cause is unknown.

Consumption or Tuberculosis-

A generation ago there was general despair in respect to consump-This disease shows itself chiefly among young adults. The beautiful fair-haired girl, a keen student at school, suddenly develops a cough, a weariness, and loss of appetite. The doctor announces "she has tuberculosis". The anxious mother feels that the death-warrant of her beautiful daughter has been signed. But thanks to the combined application of rest, good food, outdoor life and sunshine, consumption is usually checked and often cured, so that the death-rate of 145 per 100M has been cut in half and tuberculosis, instead of ranking second in the list of "killing" diseases now occupies fifth place.

Tuberculosis is prevented by the use of better living quarters, the avoidance of crowding, by the separation of children from their tuberculous parents, brothers and sisters, by the use of pasteurized milk (thus avoiding the bovine type of the disease), by the control of flies. and general sanitary measures.

After over 26 years of public health work, I am sometimes discouraged with the slow progress made in the control of disease. When on the part of the errant cell is un-I recollect that 311 millions are year and that less than seven millions are spent in the prevention of sickness, I sometimes despair of the eventual control of disease. But the facts to which I have just referred give me comfort and I thank God and take courage, that the future may bring, in respect to other diseases, results similar to those gained in diphtheria, typhoid and tuber culosis.

Cancer-The present day despair and terror in respect to cancer is similar to they are now classified as typhus the despair and terror which 30 or and typhoid fever, pneumonia, ma-40 years ago existed in respect to laria, etc. Many physicians believe diphtheria. While there is to-day that cancer is similarly a general no perfect cure for cancer, yet the term that may cover a variety of measures for the treatment of can- diseases. It is well known that eer are infinitely superior to those for the treatment of diphtheria be- the skin for example, and it may be fore the year 1895. While there is that the light of future knowledge no complete treatment of cancer, will separate cancer into its comresearch into this affection is far ponent parts, and aid in the solution more advanced and the prospects for a cure infinitely better than the corresponding prospects for diphtheria, typhoid and tuberculosis

forty years ago. Speaking at Chicago recently, Dr. Bloodgood said: "A beautiful woman doesn't have cancer of the face. on her face she goes to a physician. That is a valuable lesson for men to

"Women smoke, but they do not develop cancer of the mouth. The due to the influence of some exterreason-they keep their teeth free of nicotine. That's another lesson for their husbands and brothers."

increase in the incidence of cancer. If we take our own country alone, the mortality from cancer has shown a successive and steady rise over a long period, one must admit that cancer is increasing.

Statistics of Cancer Mortality-

I suppose you are not fond of that there is an alarming increase of elderly persons. These are not can this affection. Beginning with 1914 cer; they are pre-cancerons condithe mortality rate for cancer in Ontario was 69 per 100,000 of population; in 1929 the rate was 104, and The Origin and Cause of Cancerlast year 109.5, an increase of 5 1/2 per 100,000 in a single year.

During the last decade the rate of increase has been nearly 20.0 per 100,000 of population, or a relative increase of 31%. For certain re gions of the body, the stomach, the include: ntestines, and the female organs of generation, the increase has been particularly marked and is in comparative accord with that found is most countries. The annual loss of life from cancer in Ontario has, in the aggregate now reached 3,635 and the total number of cases cannot fall short of 10,000.

The increase in cancer mortality is general all over Canada, the rate peing 93 in 1930, or an increase c over that of 1929, and of 470 in he number of deaths.

The newer sections of .he could try, Alberta, Manitoba and Saekatchewan, with fewer people of the cancer age, have the lower rates.

The records for England and Wales since 1847, show an ever-in creasing tide of cancer mortality During this period the rate has risen from 27.4 per 100,000 to 145.3 The United States, and particularly the continent of Europe show an equal or greater increase and all over the civilized world viere is the highest interest in research as to the cause of cancer, and experiments in treatment to contro this mighty scourge.

The Nature of Cancer-

The human body is composed of millions of cells, cells that can be seen only when magnified about 500 times, when they appear to be of the size of a small pin's head.

and semi-solid contents in the middle of which is a smaller spherical body known as the nucleus, and upon which the life of the whole cell depends. In its normal life history the nucleus and subsequently the cell itself divides. The cells grow to full size and are ready to divide in their turn. The process of further division depends upon a number of circumstances many of which are unknown, but in part it depends on the nature of the cell. Thus the skin is constantly being renewed by division of the deepest layer of cells, whereas nerve cells are never renewed once they have been formed. Although cells typically are of spherical form, they may, from pressure, become flat tened, columnar, polyhedral or ir-

regular in shape. The cancer cell is a normal cell of the body, but for some unknown reason this cell departs from the ordinary habit, and not only divides but continues to subdivide indefin-Under the microscope one can observe the birth and growth of the cancer cell, can see it spread, invade and destroy the healthy tissues: one can distinguish cancer cells from the ordinary tissue cells, and classification of the different types of cancer and tumour growth can be made.

Cancer seems to be a local rebellion of a group of cells against the established order. The rebellious cells are unrestrained in their action; they are "bolshevists", and if other forms, is probably excited by the local riot is not properly checked it may develop so as to destroy of the body. In this field research

life. The cause of this untoward action spent on sickness in Canada every it is not hereditary; it is not introduced from without; it is generated using a mixed diet, the kind within the body. There is no true germ or parasite to which growth of cancer can be ascribed. Cancer itself is a parasite grafted upon the human organism upon which it acts in a destructive fash-

Cancer may be a combination of a term used to cover a large variety there are several types of cancer of of its control. Pre-Cancerous Growth

In addition to the true cancer there are other forms of irregular growths known as benign tumours. These are all more or less associated with malignant or cancer tumours but are comparatively harmless in Why? Because with the first blemish themselves. There are cell processes which precede true canser and which are known as pre-cancerous conditions. These pre-cancerous reactions of tissue cells appear to nal irritant or of some internal stimulus. Some of these growths re sult in cancer, and most cancers de-But there is after all this, a real velop from some such primary over growth of cells. Thus it appears that there is a stage in the life history of cancer when the growth while a departure from the normal is not actually cancer. Examples of earliest opportunity.

this are seen in the pearly appear

ance of the lip in smokers, in the white spots on the tongue or inside statistics, and I shall burden you the cheek, or in the scaly accumulawith only sufficient to convince you tions of epidermis on the faces of tions which may and frequently do become cancerous.

As already pointed out, no real cause of cancer has so far been dis covered. All the causes which we know of are predisposing or exciting conditions which appear to be related to the origin of cancer. These

- 1. Hereditary predispositions.
- 2. Age. 3. Embryological faults.
- 4. Irritation and injury. 5. Biochemical stimuli.
- 6. Diet and civilization.

Heredity-In both animals and men there are those whose susceptibility to cancer is stronger or weaker than is the case with others. As in tuberculosis and many other affections the tendency to acquire the disease is higher in some than in others Such persons are relatively mor susceptible than other persons, their resistance to the particular affection less, the soil is more favourable to the growth of the disease. The hereditary predisposition to cancer is, like that of tuberculosis, the true conception. There is no evidence that cancer is transferred from parent to child.

Age is a definite factor in the onset of cancer. While malignant growths may originate at any age, the liability to cancer increases with the years of life. The work of preventive medicine has extended the length of life of the individual. Through this extension there is provided an additional number of potential cancer victims. The newer countries with a younger population have less cancer than the older civi-In its simplest form the cell is a lizations. As the populaton becomes spherical body with a definite wall, of more advanced age, the mortality of cancer increases.

> Embryological Faults-The human body is a complex and wonderful structure. Its elements are the product of a single cell. As in all structures there are "faults" in the body construction, and it is not uncommon for a tumour to grow from one of these faults. Only a few of such growths are dangerous; most of them are innocent. The great cancers of the body, as a rule, take their origin from mature cells but now and then one develops from an embryological fault.

Irritation and Injury-It is not known how irritation acts in exciting the growth of can cer, but there is no doubt that in jury and chronic irritation of a part often induce cancer. The surface of the body and the alimentary canal are among the chief sites of cancer These regions also are the most subject to irritation. Many chemical and physical agents are known to excite cancer. Irritation is the the parts of the body subject to injurious influences. Knowledge of this fact is of assistance in the prevention of cancer. Avoidance of irritation or the removal of irritating agents are the potent measures in

the reduction of cancer. Biochemical Stimuli-The human body is a complex chemical laboratory. The growth of glandular -cancer, and perhaps the influence of chemical processes may possibly uncover the real cause

of cancer. Diet and Civilization-

Since cancer occurs alike in vegediseases. Fifty years ago fever was may act as irritants or cause indi-sidered by some clinicians to be the gestion, and so provoke cancer of of affections. The cause of most of the stomach or intestines. Nor can these fevers having been discovered, civilization justly be blamed for the ed habits, higher life development and the greater average of civilization may account for the possible excess of the cancer of civilized people over that of primitive life and assume primitive habits. The remedy is rather to gain control of cancer by research and application of scientific knowledg ! The Growth and Spread of Cancer

As already indicated cancer grows by the proliferation of its cells to form additional cancer cells and that cancer spreads through invasion of adjacent tissue by the cancer cells or by their dissemination blood vessels to distant parts. The spread of the original growth to cancer comes from this invasion. destructive effect of the invading cells vary greatly in different cancers and thus some cancers are much more dangerous than others. To time for successful action is limited. Diagnosis and treatment, to be satisfactory, must be applied at the

its beginning, or removal of irritapre-cancerous states would do much local disease, and if removed in the early stage is curable.

Decline and Death of Cancer a cancer is a living thing, an like all living things it cannot last orever. Dr. David Arthur Welsh, F.R.C.P., Edin., writes in a fascinat ing manner of this and other epochs of the life history of cancer. He

SATS: "A few cancers reach the term of out. What sometimes happens is state of knowledge, surgery still this: the doctor declares with truth that an advanced cancer is hopelessly inoperable, and that he can do no more: the patient in desperation tries some quack remedy. Then the increditable thing happens: the cancer begins to die and the patient begins to live again. Not one in 1000 cancers, perhaps not one 10,000 is so obliging as to die before its human host."

But the incredible fact has hapened through the cancer possessing a low order of vitality or because of the high resistance of the body, and this fact is encouraging in that research may discover a means of accelerating the exhaustion of cancer vitality or of increasing bodily resistance to malignancy.

The Early Signs of Cancer-

The early signs of cancer are frequently obscure. In many there is no apparent tumour. Most of them are painless. They are painless until their size causes pressure on nerve filaments, or interferes with the function of an organ. But usually there are danger signals. There is sore, say on the lip, the tongue or inside of the cheek, which fails to heal; there is the red flag of haemorrhage from the lower bowel or the internal organs of women; there is the lump in the breast, the continued hoarseness from a growth in the larynx; the protracted indigestion which fails to respond to the usual remedies. These are facts which should be matters of everyday knowledge. Any of these signs should be regarded with the gravest suspicion and every opportunity taken to prove or disprove their association with cancer. Neither patient nor doctor can afford to gamble on the chances that any single one of these signs is an innocent one. Nothing should be left to chance. Every available means of diagnosis, under such circumstances, should be resorted to and the investigation of such signs should be pursued until the question of cancer or no cancer is solved.

It is a very great misfortune for the human race that cancer in its early stages is not often accompcommonest "cause" of cancers of anied by pain. If cancer were only as painful as a toothache from the start, thousands of those who procrastinate until the disease is to far gone for curative measures would be relieved of their troubles and cured of their diseases.

Modern Methods of Treatment o Cancer

The chief resources in the treat ment of cancer are: Surgery, X-rays and Radium.

Of these resources that of surgery has long held the field, and surgery remains the most potent agent of treatment in cancer of the stomach of the intestines, the fundus of the uterus, and other abdominal organs. though this field is being somewhat invaded by irradiation either as an ctive or as an auxiliary to surgical consumed has probably no effect in treatment; it is still the best reoriginating cancer. No diet will source in cancer of the larynx and predispose to, nor prevent cancer in oesophagus, but in these fields also the individual. But the manner in radium is taking a part. In treatwhich food is used may cause irri- ment of cancer of the breast surgery tation, and thus excite a malignant holds the chief place. Here again growth. Foods taken too hot, or radium and X-rays are widely used bolted without proper mastication, in auxiliary treatment and are con-

best method. In cancers of the surface of the body, the lips, buccal cavity, the induction of cancer. Certain civiliz- jaws and throat and the uterine cervix, radium and X-rays afford very satisfactory results, especially if cases are seen early, a requisite that widely enhances the opportunity of cure by any method. It appeople. It is obviously impossible pears, therefore, that for the larges to disown the advantages of civilized number of cancers of the human body, surgery is still the method of choice, but it is equally apparent that both radium and X-rays are powerful and effective methods of treatment, and that facilities treatment of cases should include

the best in all three lines. In addition to these there is a variety of therapeutic measures such as various serums, the use of colloidal lead, etc., the re through the lymphatic vessels and sults from which are, so far, too remote as seriously to enter into competition with the proven results of other parts of the body is known as the well-known triad mentioned. metastasis. The great danger in What the future holds in the direc tion of new treatment of cancer, i The rate of this invasion and the is impossible to say. It is the hope of everyone that simpler and even more effective therapeutic agents in cancer treatment may, ere long, be discovered.

Destruction of a small cancer at treatment since the days of the im-

mortal Lister has shown an extra tion and continued observation of ordinary development, and some of the most prominent surgeons are of to limit the mortality of this dang- the opinion that its limits as a thera rous disease. Cancer is at first a pentic measure have almost been reached. Surgery still holds the field in cancer treatment; the surgeon has reached an astonishingly high degree of skill; he is confiden of himself, and it will only be by a discovery of newer, more exact, and simpler methods that he will be dethroned

The limited time in this address given to the consideration of the surgical treatment of cancer, fails to their natural life before they kill indicate the immense value of sur the patient. Every doctor who has gery as a therapeutic agent in malmuch experience of cancer can ignant growths. The surgical treatrecall instances where a cancer ap- ment of cancer is so well-known pears to have been checked in its both within and without the profesmalignant career, where it has ceas- sion that it seems out of place to ed to grow and where it has died say more than that, in our present holds the premier position; it is still the line of approach in the majority of cancers.

Opinion of the value of early sur gical measures in cancer is given by Lord Movnihan, one of the most distinguished of British surgeons, as follows:

"No better illustration of the value of early surgical interference in cases, for example, of cancer of the breast could be given than the statistics published three years ago by our Minister of Health. Very operation for cancer of this origin was performed in the early stage of the disease, 90.1% of women were alive and well ten years after operation, whereas if the disease was very dvanced, 94.4% were dead within this period. The nature of the disease was the same, the operation the same; the stage of the disease made all the difference. It is true to say that every single case of cancer where the disease is accessible to the surgeon, is curable in the early stage, for cancer is at first a local disease. It is quite obvious, therefore, that the future success of surgery very largely depends upon the education of the public in these matof that fact that their only fear should be the fear of delay."

Radium-Radium is. a radio-active stance derived from pitchblende, the chief source of which is the Belgian Congo. In 1896 Becquerel discover ed that the element uranium, the important constituent of pitch blende, emitted rays capable of passing through material substances and a little later M. and Mme. Curie proved that these rays were produced by the disintegration of the uran ium atom, that a new element which they called radium was formed, and that this in its turn was subject to which similar rays were emitted.

The total (approximately) of raounces. The United States owns 50 grams, the British Isles 60 grams and France 50 grams.

Radium is used in two forms first as the element which in appear grams of radium element.

The disintegration of radium is slow process, one-half disappearing in a period of 1690 years. Its final living hand projected upon the disosition is lead. During the process of disintegration energy is liberated in the form of alpha, beta effect as the rays from radium. They and gamma rays. The emanation of are really the same thing but can be radium is a gas which will be lost used where the local situation of unless the radium from which it a- the growth prevents the ready aprises is kept in a sealed receptacle. In the sealed container radium emanation gradually accumulates in an example, cancers of all kinds are chiefly in the form of 'seeds', which the rays being forced in close to the are tiny sealed receptacles of gold growth, in the abdomen or breast, or other material, and which may growth, the time employed and the

In a little less than four days the emanation (radon) loses half its strength Radium is very expensive. Its

production at present is chiefly in the hands of the company called the gery in the treatment of cancer, with Radium Beige with headquarters at the fortunate exception that in can-Brussels. The company's works are at Oolen, near Antwerp, and the operation of transforming pitchblende to radium, requires 67 processes. The effect of radium element, of

the emanation and of X-rays, is much the same, and preference for one or the other, is chiefly a matter to show that this disease of humaniof convenience, accessibility of the growth, and personal experience. hard or gamma rays are used, the softer rays being cut off by a filter of lead, platinum or other metal. The reason why these rays, in ap propriate dose, destroy cancer cells and at the same time have a mini mum effect upon normal cells of the body, is largely because the cancer cells are in a constant state of di vision, and are, consequently, more sensitive to the rays than normal cells. In addition to this, the rays are believed to have an effect upon the sarrounding tissues, which contributes to the cure of cancer.

Both X-rays and radium in exceslive dose, are very dangerous, so those in charge of treatment must use the greatest care in prescribing In an address of this nature it is the dosage used, and in adopting unnecessary to dilate upon the value safeguards necessary to the protec-of surgical treatment. This form of tion of both workers and patients.

# THE CAMPAIGN JUDGES WILL BEGIN THE FINAL COUNT AT EIGHT ON SATURDAY NIGHT

# Reserve Vote Statements of All Candidates Now in Sealed Ballot Box at Bank of Toronto

Promptly at eight o'clock this Saturday night the Judges of The Standard's Subscription Drive (selected at the outset of the competition) will assemble at The Bank of Toronto to begin the final count of votes to letermine the winners in the campaign.

All active candidates have signed statements of their votes to date to be deposited in the sealed ballot box at The Bank of Toronto. The judges will examine the reports made in the ballot box during this week, add the reserve votes to the total secured by each candidate this week and thus determine the final position of each in the race.

The Board of Judges consists of Mr. J. C. Mercer, Reeve of Markdale;

Mr. A. G. Robertson, Manager of The Bank of Montreal, Markdale; Mr. J. A. Davis, Reeve of Artemesia; Mr. J. S. Price, Deputy-Reeve of Holland, and Dr. J. A. McArthur, Justice of the Peace, Markdale. These gentlemen are all widely known in this territory and their decision on Saturday night will be unquestioned.

It is to be expected that the decision of the Judges will be made sometime around nine p.m. Saturday. As soon as an official announcement of the winners has been made all candidates may come to The Standard Office to receive their awards.

are dangerous in the hands of persons unskilled in their use. Roentgen or X-rays—
On Nov. 8th, 1895, a new kind of

ray was discovered in Wurzburg, Bavaria, Germany, by Prof. Wilhelm Conrad Roentgen, Professor of Physics in the University, a Doctor of Philosophy. For the first time was seen a light never before observed on land or sea. It was a ters and of a very clear recognition faint, greenish illumination upon a bit of cardboard, painted over with a fluorescent chemical preparation. Upon the faintly luminous surface was seen the line of dark shadow. The experiment was carried on in a darkened room from which every known kind of ray had been serupulously excluded. A Crooke's tube stimulated internally by sparks from an induction coil, was provided and carefully covered by a shield of black cardboard impervious to every known kind of light. Nothing was visible until the hitherto unrecog nized rays, emanating from the Crooke's tube and penetrating the cardboard shield, fell upon the lucontinuous disintegration, during minous screen, thus revealing the

new rays. The visible rays,—they were visdium available in the world is 25 ible until they fell upon the chemically painted screen-were found to an enormous penetrative have power, passing through cardboard, cloth and wood with ease. They would go through a thick plank or ance resembles white pepper, and, a book of 2,000 pages. But copper, second, in solution from which an iron, lead, silver and gold were less emanation or gas called radon, is penetrable, the densest of them beproduced. The dose in each form can ing practically opaque. White flesh e accurately measured and is us- was very transparent, bones were ually referred to as so many milli- fairly opaque, and so the discoverer interposing his hand between the source of the rays and the luminescent cardboard, saw the bones of his

> screen. The X-rays have much the same plication of radium.

In certain places in Germany, for ncreasing amount, and it is used treated with X-rays, the projector of just as one can force one's fist into a inserted into or about the soft pillow. Both the rays of radium and X-rays can be accurately meas quantity used constituting the dose, ured, there being an international "yard-stick" for this purpose, thus allowing of the dose in one country being the same as in another.

Neither radium nor X-rays are cure-alls, they are auxiliaries to surcers of the mouth, throat, lips, skin and the uterine cervix, they are probably better methods of treat ment than surgery.

Hopes for the Cancer patient-Thousands of reports of cance have been accumulated all tending ty is almost never hopeless; that cures have been obtained in seem For the treatment of tumours, the ingly the most futile cases, and tha the greatest obstacle to the improv ed treatment of the disease is the mental lethargy and the hopeless attitude of the general public.

This public condition can be changed only by education, by the use of the true facts about cancer, by the spread of knowledge as to newer and improved methods treatment and by urging the public to present themselves to the physician not when the earliest signs appear, but yearly after 35 years of age, just as they visit the dentist. Prevention of Cancer-

Prevention of cancer may be a chieved to a considerable degree by the education of the public and of doctors, nurses, and dentists in the early signs of the disease.

It is a lamentable fact that, all over the world, one sees the majority of cases coming too late for

from X-rays or radium, demands treatment. There is a fear of canprolonged experience and meticulous cer. The only fear should be the care. It is a form of treatment that fear of delay. Education in the can only be successful and be car- early signs of cancer will be of serbriefly, it was found that when the ried out safely in an institution for vice; the great hope is the public the purpose, in the hands of skilled health education of the child. In operators; it is NOT one for the this work every professional unit general practitioner. Everywhere can assist; the doctor, the dentist, this fact must be stressed. The the teacher and the nurse. There rays of radium and the Roentgen must be wide publicity, through the rays are invisible, potent against press, by radio, by exhibits, by lecfor good when properly used; they tures, pamphlets, and by personal contact. These will cost money, but no money could be more wisely spent. The periodical health examination, like the yearly visit to the dentist, would save many lives.

### OWLS TAKE CHICKENS

Several farmers in this locality lost chickens from unknown marauders recently and traps were set to catch them at work. Mr. Sam McMullen and Mr. Roy Piper were two of those who lost fowl and each was fortunate in catching an owl as it came back for more booty. The owl Mr. Piper captured had a wing spread of four feet, six inches.—The Flesherton

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