

CANCER

a Nutritional Deficiency

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Hospital, I noticed that many more cancer patients were admitted to the hospital in the spring than in the fall. A great many of these cases were from the country. I began to wonder whether there might be some connection between the restricted diet taken by people on western farms in winter, with its low nutritional content, and the incidence of the disease. I remembered my own boyhood on a farm near Manitou, 80 miles from the railroad, when our diet was rich in natural nutrition found in such substances as crushed wheat, grown on the farm, with none of its potent factors removed, raw vegetables and unpasteurized milk, fresh from the cow. In those early days cancer was rare. I reflected that some of the canned foods of the modern farmer might lack some essential factors of health.

I decided to make the assumption that cancer was a deficiency disease and to follow this line of research wherever it might lead me.

In order to test this theory, I began 10 years of experiments with white mice in the basement of my home in Winnipeg in 1932. In mice it is possible to observe cancer in rapid development during several generations, a thing which could not be done in the case of human patients.

All mice were treated in the same way to produce cancer throughout my experiments. I removed a small area of hair on the back of the neck, with a 10 per cent solution of sodium sulphide, and painted the area with gas-works tar every third day. I fed the mice on a low-nutritional diet. They scratched off the tar and broke down an area of skin. This produced a cancer, whether caused more by the effect of the tar or the scratching I could not judge.

To give one example of many hundreds of experiments — I took three pairs of the offspring of a cancerous female mouse and bred them along three different lines of diet for four generations. One strain I fed on a diet of high vitamin content and the fourth generation was a fine, healthy animal, with no trace of cancer whatever. Another strain I fed on a household diet and in this case the fourth generation showed only a slightly greater degree of cancer than the original ancestor female. The third strain I fed on a very poor diet and, at the end of the fourth generation, the animals had cancer which covered their entire heads and 50 per cent of their bodies. The photograph shows the result of this experiment.

I succeeded in developing a strain of mice with 100 per cent cancer. Then, taking the offspring of this strain, I fed them a

high vitamin diet and eventually developed a strain which would resist cancer under the same conditions as their ancestors developed it. This established to my satisfaction the theory that the degree of cancer resistancy in mice is directly dependent on diet.

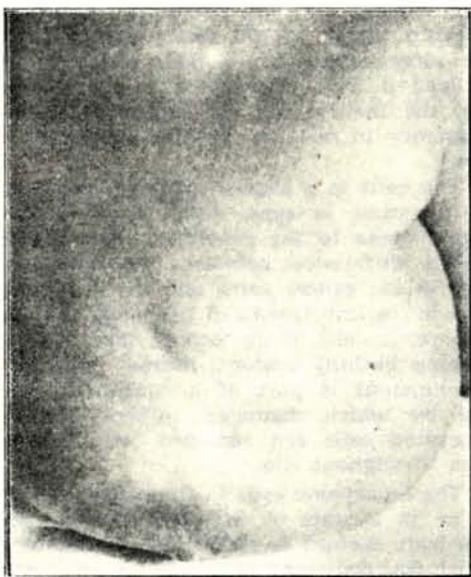
The cells in a cancer sore are embryonic or immature in type. After close observation, I came to the conclusion that the essential difference between the embryonic cells in the cancer sores and the embryonic cells in healthy tissues of mice was that the embryonic cells in the cancer sores did not develop to fully mature, normal cells. This development is part of a continuous process by which damaged, injured and degenerated cells are replaced with healthy cells throughout life.

The embryonic cells in the cancer seemed to be in a state of arrested development. The body seemed to lack some potent factor which was necessary to enable the embryonic cells to continue their differentiation in the normal way. I determined to try to discover this potent factor.

In observing the pregnancies of mice with cancer, I noticed a curious thing. The cancer in a female mouse became inactive during the period of gestation and for about half the period of lactation. Then it became active again. It was as though the developing young in the gestation period of the mouse contained some factor which protected the mother against the cancer. I formed the conclusion that the potent factor would be at its strongest in the newborn offspring.

Proceeding on his theory, I prepared an extract from the tissue of the newborn offspring of the strain of cancer-resistant mice which, as previously mentioned, had been developed. This extract contained the full set up of the young endocrine glands. Injecting this extract into mice suffering from a high degree of cancer, I found that their cancers receded much more rapidly than if they were treated by high vitamin diet alone. In a remarkably short time the sores were replaced with healthy tissue.

In the course of my experiments, I came to the conclusion that the origin of cancer must be traced right back to the fertilized ovum, the origin of the life force of every individual. It is the fertilized ovum which sets the standard of every individual's development. The fertilized ovum produced by two healthy mates is highly resistant to cancer, whereas the offspring from the fertilized ovum produced by susceptible mates has a low degree of resistancy. In mice, the raising or lowering of the cancer



April 1939

resistancy was associated with the fertilized ovum. Among mice with advanced cancer, there was little mating. In the case of highly resistant mice, mating was abnormally active.

Extract used with Human Patient

I hesitated for some time before taking the major step of using the extract on a human patient. I did this for the first time in July, 1938, in the case of a woman of 82, suffering from a cancer of the right breast and also from a serious cardiac condition. As she was in considerable distress, both she and her relatives were willing that I should make the experiment. When she consulted me first, examination showed a mass in the right breast about the size of a medium grapefruit, with a foul discharge from a deep, ulcerating cavity occupying the area of the right nipple, with a hard, elevated and everted edge, which had been in progress for three years, and a mass of enlarged glands in the right axilla.

I gave this patient hypodermic injections of my young tissue (Y.T.) extract and placed her on a high vitamin diet. After a few months of treatment, there was a noticeable recession in the hard, nodular tissue which became softer, especially around the edge of the cavity. The cavity began to fill in with granular tissue. Later, there was a marked recession of the axillary glands. The patient's age and heart conditions were against her, however. Her heart became

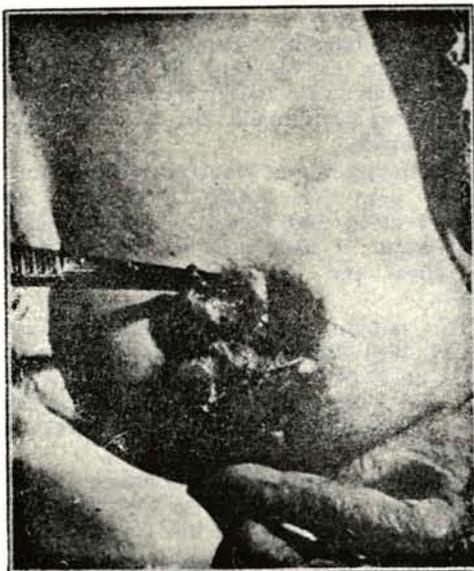
irregular and weak and in September, 1939, she died of hypostatic pneumonia.

The beneficial results observed from the treatment in this case led me to apply it a second time in March 1939, in the case of a woman who was then 81 and is now nearing her 85th birthday. This patient was suffering from a cancer in the left breast but refused operation. When she first consulted me, her left breast showed a dimple, with surrounding tissue which was hard and firm, while a hard, nodular mass was felt beneath, the size of a medium crab-apple. No enlarged axillary glands were found. A biopsy showed the tissue to be of a fibrous nature. As she refused any further cutting, diagnosis of cancer was made from the history of the case and clinical symptoms which were substantiated by the progress and course of the disease. She was treated with injections of Y.T. extract and given an appropriate diet with extra vitamins. She is a co-operative patient and faithful in her treatment.

The photographs will give an idea of the progress made in this case of cancer of the breast. The history of the case under treatment may be summarized as follows. In February, 1941, there was a marked retraction of the nipple and the hard tissue adjoining the nipple began to break down at the junction of the abnormal and the healthy tissue, leaving a circular sore. In June, 1941, the mass of unhealthy tissue became freely moveable and was lifted out with



February, 1941



June 19th, 1941

forceps in my office leaving a large, open cavity which began to heal up and close in. At her age the process of healing seemed to be very slow, so I had a surgeon freshen the edges and suture together the wound, which healed up by first intention. Today this old lady is enjoying the best of health. Last year she made a trip to visit relatives in western Manitoba and she is planning to make a trip to eastern Canada in the spring, to see friends there.

At the present time I am treating a goodly number of patients with Y.T. extract injections and a high vitamin diet and they have all responded to treatment in a greater or lesser degree. I do not pretend to be able to benefit patients in whom the disease has reached advanced or terminal stages, because that does not give any treatment a fair chance. In the patients whom I am treating, however, some of whom have suffered from clearly diagnosed cancers of a severe degree, I can claim some improvement in many cases.

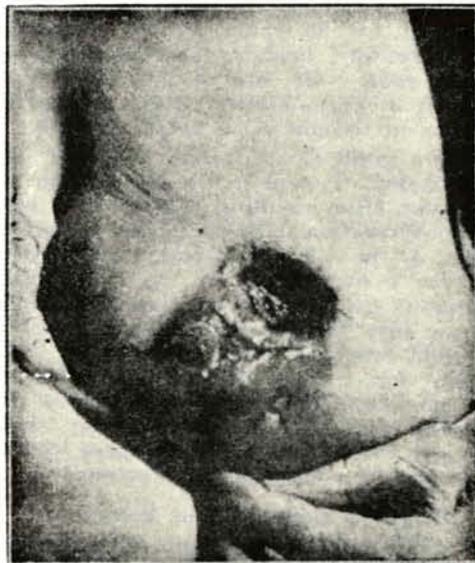
The diet which I prescribe, varied to some extent in each individual case, includes one pint of vegetable juice per day, such as carrot, lettuce, and celery juice, prepared freshly, plenty of raw vegetables particularly peas, beans and carrots, spinach, lettuce, Hovis or whole-wheat bread, supplemented by wheat-germ, meat cooked rare, raw milk and concentrated vitamin preparations of various kinds.

In one case I was able to achieve the

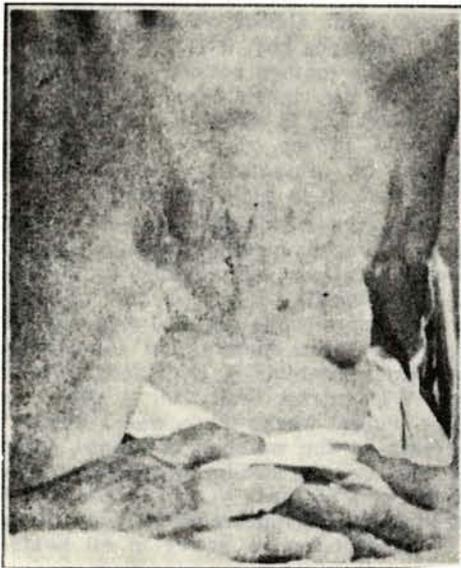
desired result almost wholly by diet. This was a Winnipeg boy of 11. In the early part of 1935, his mother noticed a few enlarged glands on the right side of the neck which kept increasing in size and number and did not yield to the various treatments prescribed by physicians. His grandfather, cousin and uncle each had cancer.

The boy was brought to my office in 1937. Biopsy showed lympho-sarcoma which on several occasions was verified by outstanding pathologists. I placed the boy on a simple, appropriate, natural balanced diet, high in vitamin content and supplemented with extra vitamins A, B(c) and E. He also took Y.T. extract orally for a short time. After several weeks there was a noticeable decrease in the number of glands appearing and later the swelling gradually receded. At the end of three years, all trace of the swelling had disappeared and today the boy is in perfect health, active in all kinds of sports.

In another case I was able to discontinue the Y.T. extract injections after four months. This was Mrs. A. McD., 49, of Pembina, N.D. In 1939, the patient had a cancer of the breast removed by surgery. She took treatment from me of extract injections and diet for one month before the operation and three months after. Then the injections were discontinued and she continued taking the diet only. She is in good health and there is no indication of any recurrence of the disease.



June 20th, 1941



Dec. 17th, 1942

The few other patients, of whom brief accounts follow, are all being treated by both Y.T. extract and diet plus extra vitamins.

Mr. W. R. S., 51, of Fort William, is a retired railroad man, who, when he first consulted me, had cancer of the right lung so far developed that he was beginning to gasp for breath. After two years of treatment, the cancer has become inactive and he is able to enjoy life in a normal way.

Patient's history: He stated he had been employed for 35 years by the Canadian Pacific railway, being a mechanical officer for 25 years. He was of late locomotive foreman at Fort William, being retired on pension on account of ill health in 1940.

"As a result of not feeling well," Mr. W. R. S. stated, "I went to the Mayo clinic at Rochester, Minn., in June, 1940, where I was under observation and examination for seven weeks. At the end of that period the doctors told me I had cancer of the right lung, diagnosing the condition as carcinoma. They put me into hospital, intending to remove the right lung but finally came to the conclusion that the growth had developed to such an extent that the operation was inadvisable. While I was in Rochester, they removed fluid from my lung three times. They gave me eight X-ray treatments."

Diagnosis Confirmed in Toronto

I commenced feeling quite sick after I came home from Rochester. In September, I went to Toronto and interviewed some

chest specialists who verified the Rochester finding and told me to go home and keep working as long as I could. They held out no hopes for my recovery. Early in October I went again to Rochester and received four more X-ray treatments but I continued to fail in health.

"By the middle of November, I was starting to gasp for breath. I couldn't eat, couldn't sleep and began to find difficulty in walking. I had a lot of discomfort in my chest and lost eight pounds in one month."

This patient came to my office, November 26, 1940. He then weighed 153 pounds. I took an X-ray of his chest and placed him on a diet which was augmented by concentrated vitamin capsules and Y.T. extract injections.

About the middle of December he collapsed and was confined to bed, but continued the treatment. In the course of two months he was able to get his clothes on again and two weeks later was walking round. About the end of February, 1941, he was again able to get down to my office for his treatments. On February 28, he weighed 146 pounds. From the end of that month he gained weight steadily and now weighs 160 pounds.

He remained in Winnipeg until the end of June and then returned to Fort William continuing to receive injections of the Y.T. extract.

He feels infinitely better and the recent X-ray pictures taken show a decided recession of the disease in the lung. He was feeling so well in the summer of this year, and aching for something to do, that he converted his house into a duplex.

Summaries of a few other cases follow:

Mr. W. T., 49, a French-Canadian residing in St. Boniface. This was clearly a case of poor diet. This man had to support a wife and four children on a very modest wage, working long hours in a box factory, with no holidays for many years, except for Saturday afternoons and statutory holidays. When he consulted me in January, 1941, he had an active cancer about the size of a quarter on the left side of his nose. After one year of treatment, the cancer has disappeared and has been replaced by healthy tissue.

Mr. W. C., 41, employed in a grain elevator at Fort William, working long hours in an atmosphere charged with grain dust. In March, 1940, cancer of the throat was diagnosed by Rochester as highly active. He was treated at Rochester on two separate occasions, successively by surgery and ra-

dium seeds. In November the condition appeared to have disappeared. In May, 1941, cancer re-appeared in the throat. He was unable to obtain permission to go to Rochester owing to wartime restrictions, so consulted me in July of that year. Treatment here had the effect of receding the cancer and today he is in normal health.

Mr. S. S. C., 50. The father and mother of this patient died of cancer. He was never robust and complained of considerable stomach trouble. In 1933 he noticed a sore on his lower lip which kept increasing in size. He had it removed by operation in October, 1939. Diagnosis by biopsy, epithelioma. In less than five months nodules appeared beneath the left jaw and in the surrounding tissue. When he consulted me, May 7, 1940, he was thin and emaciated and showed little energy. The submaxillary gland was enlarged to the size of a large plum and a number of smaller glands were observed in the surrounding tissue. He was given the usual treatment for three weeks and the glands were removed by operation, May 28, 1940. Biopsy report of the enlarged gland showed a large epidermoid carcinoma with degeneration. Treatment was continued. He has made a good recovery. There has been no sign of a recurrence of the disease. He states he is enjoying better health now than for many years, with no stomach troubles.

Mr. C., 65. This patient has cancer of the rectum. He stated his condition was such that he was obliged to take an enormous amount of laxative every day and an enema in order to obtain movement of the bowels. He said he could not bend down to get his shoes on. In June, 1940, he stated he was

told by physicians that he had only three months to live. He consulted me later the same month and has been under treatment since that time. He then weighed 133½ pounds. He has gained 16 pounds and states there is no comparison between how he felt then and now. He is generally active and can touch his toes readily. He now only takes a small amount of laxative for bowel movement.

Conclusions

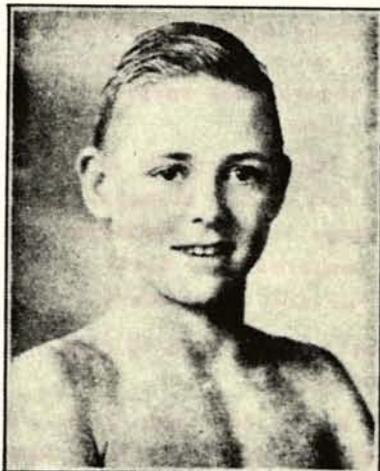
Whether or not these and many other cases I could instance are sufficient to establish my theory, must be left for others to judge. My conclusions may be summed up by saying — I believe cancer, a deficiency disease, can be prevented and controlled by a suitable and balanced diet, high in vitamin content. When the disease is present and well established, treatment is a different proposition. I use the young tissue extract in such cases.

The next step in this line of research work is to find out the correlation existing between the different vitamins and the endocrine glands. When this is done it will simplify prevention and control of the disease and make the treatment easier, because I feel that sufficient products are now manufactured by scientific research workers for this purpose, if only we knew the correlation existing between the different factors involved in the treatment.

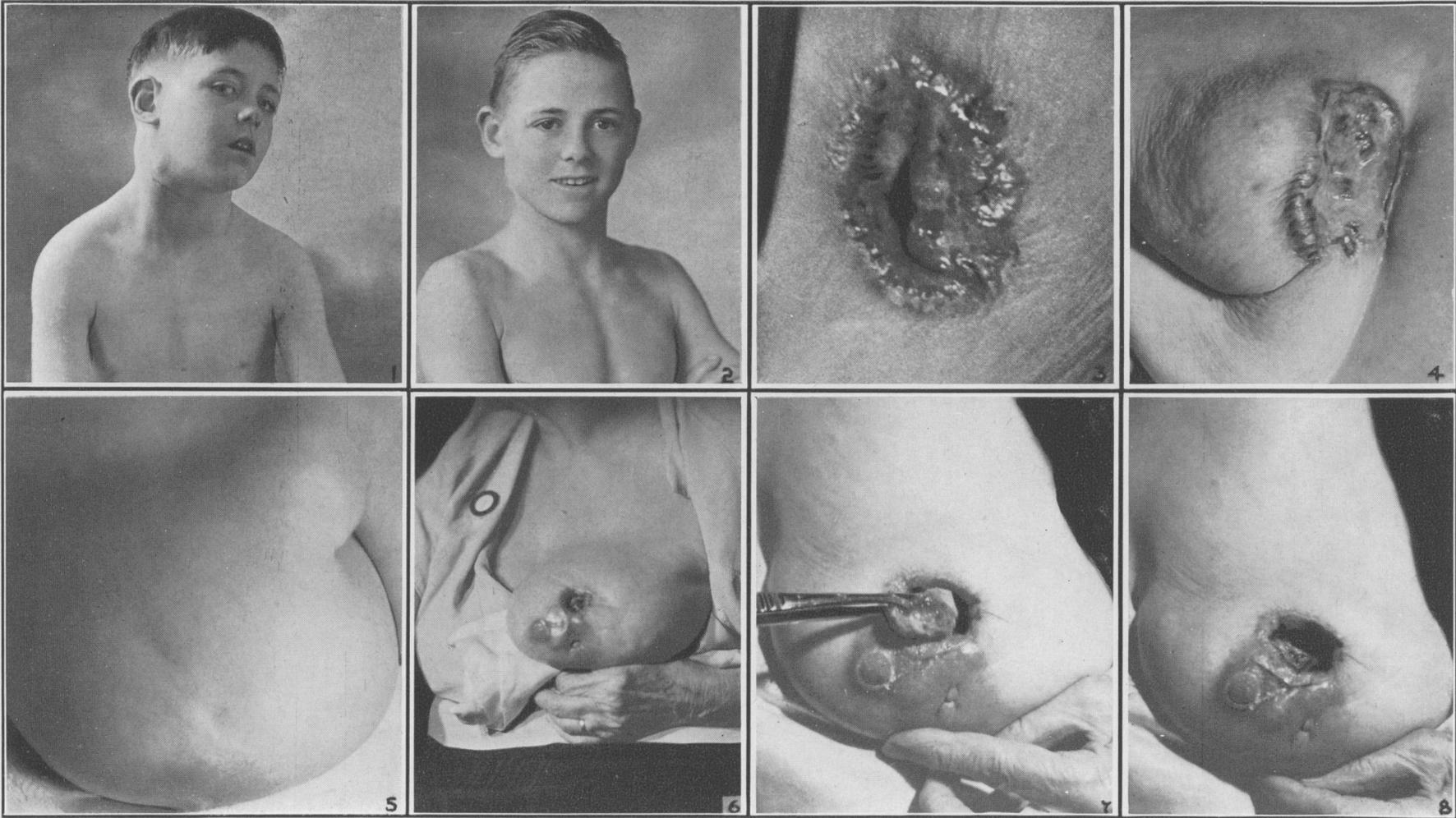
I am content to submit my findings in all humility to the readers of this journal, knowing that it will be their sincere desire to explore every possible avenue of attack on what has hitherto been one of the most intractable diseases to afflict the human race.



1937



1941



Figures 1 to 8

PRELIMINARY REPORT ON PREVENTION, CONTROL AND TREATMENT OF
HUMAN CANCER AS A DEFICIENCY DISEASE

J. R. DAVIDSON, M.D.

Winnipeg

IN 1939 a report¹ was made of an attempt to inhibit the development of tar-carcinoma in mice, and of two cases of human malignancy which had been given a simple, appropriate, natural, balanced diet, high in vitamin content, and treatment somewhat similar to that which the mice received.

The following is a further, brief report on the above cases and on some other human malignancy cases for periods up to several months.

CASE 1

I.B.C. (mentioned in above report). Age 11 years. Weight 68 lbs. at beginning of treatment.

Past history.—Nothing of importance.

Family history.—His grandfather, cousin, and uncle, each had cancer.

History of present illness.—In the early part of 1935 his mother noticed a few enlarged glands in the right side of the neck which kept increasing in size and number, and did not yield to the various treatments given by physicians.

Early part of 1937.—Biopsy showed lympho-sarcoma which on several occasions was verified by outstanding pathologists. This boy was given by me, a simple, appropriate, natural, balanced diet—high in vitamin content, supplemented with extra vitamins A, B(c), and E. He also had a little embryonic tissue orally for a short time. After several weeks there was noticed a decrease in the number of glands appearing and later a gradual recession of those externally apparent. At the end of 3 years they had all disappeared and to-day the boy, age 15, wt. 93 lbs., (apparently well up to his parentage), has no symptoms of the former condition and is in perfect health, active and taking part in all kind of sports (see Figs. 1 and 2).

CASE 2

Mrs. S. Age 82 years. Weight 148 lbs. Blood pressure 190/106.

Past history.—Formerly reported as a senile patient with well marked cardiovascular degeneration, who had been treated for a heart condition.

Family history.—Brother died of cancer of the stomach.

History of present illness.—In the early part of 1936 the patient noticed the right nipple to be retracted, and a mass, the size of a small jap-orange, extending above and to the outer side of the nipple area, which kept increasing in size and later in the year (1936) broke down, leaving an open, deeply excavated ulceration, which was gradually increasing in size. Considering the age of this patient and her mental senility, the family decided to leave the breast condition alone to avoid extra suffering and the restraint that might be experienced with treatment, but consented to a special diet and hypodermic injections.

July 26, 1938.—Examination: in the right breast was a large mass, the size of a medium-sized grapefruit, with a foul discharge from a deep, ulcerating cavity occupying the area of the right nipple, with a hard elevated and everted edge, which had been in progress 3 years, and a mass of enlarged glands in the right axilla. This

patient was treated in the same way as the boy except that embryonic tissue was given hypodermically. After a few months there was noticed clinically a recession in the hard nodular tissue which became softer after several months' treatment, especially around the edge of the cavity. The cavity began to fill in with granular tissue. Photographs taken October, 1938, and July, 1939 (Figs. 3 and 4), show fairly well the changes taking place. There was noted, at the later date, a marked recession of the axillary glands. Two months after the last photograph was taken, this patient's heart became irregular and weak, and she died of hypostatic pneumonia.

December 2, 1938.—Biopsy report: "A small irregular piece of tissue. Carcinoma of breast, Grade 2, with ulceration and underlying necrosis. S. Meltzer, Assistant Pathologist, Winnipeg General Hospital."

CASE 3

Mrs. P. Age 81 years. Weight 128 lbs. Blood pressure 180/90.

Past history.—Always enjoyed good health. No serious illnesses.

Family history.—Negative for cancer.

History of present illness.—February, 1939, patient noticed a dimple in the left breast. The skin was hard and firm with a lump beneath. She stated she never had any pain or discomfort.

March 3, 1939.—Examination: a small, pale looking woman apparently well nourished, with the physical energy becoming reduced; her age might account for this or a good part of it. Her left breast showed a dimple with surrounding tissue hard and firm and a hard nodular mass was felt beneath, the size of a medium-sized crab-apple (Fig. 5). No enlarged axillary glands were found. She stated that she did not want an operation at her age. She allowed a biopsy, from which the tissue was reported to be of a fibrous nature. There was no further biopsy made. However, I am reporting the clinical picture of this case and the course the disease followed. She was given an appropriate diet with extra vitamins and hypodermic injections of embryonic tissue extract. She was a good co-operative patient and faithful in her treatment.

February, 1941.—There was marked retraction of the nipple and the hard tissue adjoining the nipple broke down, leaving an open ulcerated sore from which there was a sero-sanguineous discharge.

May, 1941.—This sore healed up and the hardened tissue surrounding the dimple broke down, leaving a well marked line of demarcation between the normal and abnormal tissue (Fig. 6).

June 19, 1941.—The mass became freely movable and detached and was lifted out leaving a large, hard and firm cavity, apparently lined with degenerated and necrosed cells, with a hard nodule remaining just below and towards the outer side of the cavity. There has been no extension of the disease beyond the breast (Figs. 7 and 8).

June 30, 1941.—This patient left the city to visit some of her relatives and friends in the western part of the province.

August 14, 1941.—A further report—Age 83 years. Weight 112 lbs. Blood pressure 140/78. During the patient's absence from the city she was unable to continue her regular treatment, and on her return to the clinic the diseased condition in the breast showed no improvement. If any change, the disease was beginning to be progressive along the lower edge of the cavity.

HERE IS AMAZING RECENT PROOF OF THE SOUNDNESS OF DR. DAVIDSON'S CONCLUSIONS- Test animals become 90% susceptible to cancer if fed refined foods, but remain 100% immune to cancer if fed natural foods.

Statement of Sir Alfred Pearce Gould (Royal College of Surgeons, London): from "Cancer and Diet" by F. L. Hoffman. Williams and Wilkens - 1937, page 49.

"Cancer is not a disease attacking the body from without, it is the result of a breach or failure of fundamental cell law; a law of which we know only the results; a law so majestic that obedience to it results in perfect development, perfect health, the full measure of days, and disobedience to it may slowly spell out all the inscrutable woes of cancer."

Gould was Senior Surgeon of the Middlesex Hospital, and an outstanding surgeon of his time and his conclusions, therefore, with reference to the period when they were made, carried great weight and to a large extent still do today. In discussing certain cases and treatment results, his final conclusion reads as follows:

"In my brief records of these cases I have not discussed the treatments employed because my present purpose is not to vaunt a remedy but to state a fact -- that cancer, even when advanced in degree and of long duration, may get better, and does sometimes get well. There is cure of cancer apart from operative removal."

Coming from a surgeon of such outstanding ability, this is one of the most remarkable confessions on record.

* * * *

Dr. Davidson's discovery that cancer should be classed as a Deficiency Disease has been confirmed by the following:

"One of the 20 chief achievements since 1938 in cancer research is proof that dietary factors influence cancer production."

Cowdry, E. V., 1951, "Trends in Cancer Research" Cancer Research, 11:603-607

Test animals put on a low-mineral, low-vitamin diet of refined foods containing a cancer-causing agent developed a 90% incidence of cancer within 22 weeks. Control animals put on a diet of natural foodstuffs, unrefined and unprocessed, developed no cancer although they received the same amount of cancer-causing agent, in the same period of time.

Mammary tumors occurred in 90% of the animals on refined foods, liver and ear duct tumors in 60% of the animals.

"These results emphasize that semi-purified or purified (refined) diets are preferable to diets of natural foodstuffs for the early and consistent production of mammary and other type tumors in young female rats."

(It was desired here to CREATE cancer so that cancer remedies could be tested in the laboratory.)

Engel, R. W. and Copeland, D. H. "Protective Action of Stock Diets Against Cancer by 2-Acetylaminofluorine". Cancer Research VI2:211-215 -- 1952.

EXPERIMENTAL DIETS AND CANCER

A considerable body of experimental evidence has been accumulated which indicates that in the experimental animal there is a close relationship between particular dietary factors and certain types of cancer. This is particularly true of cancer of the stomach and liver. This important subject has recently been reviewed by K. Sugiura (*J. Nutrition* **44**, 345 (1951)).

The Japanese workers T. Sasaki and T. Yoshida discovered in 1935 that by feeding o-aminoazotoluene to rats for three hundred days, cancer of the liver could be produced. Shortly thereafter R. Kinoshita made the observation that liver cancer could be produced in a shorter period of time by feeding para-dimethylaminoazobenzene, butter-yellow, a pigment used widely to color oils, oleomargarine and other vegetable fat substitutes. These original observations of the Japanese have since been confirmed and extended by many investigators.

When butter-yellow is fed to rats receiving a diet of unpolished rice supplemented with carrots, cirrhosis of the liver generally appears in about sixty days. By ninety days most of the livers of the test animals show cholangiomas (bile duct tumors), and at this time some hepatomas (liver cell tumors) are also present. Then, as time goes on, the production of hepatomas increases. Ordinarily, by the one hundred and fiftieth day the livers of all rats are the sites of cancerous processes involving both cholangiomas and hepatomas. If the butter-yellow is given for less than thirty days no cirrhosis or cancer develops. However, if the feeding of para-dimethylaminoazobenzene exceeds sixty days, liver cancer subsequently develops in about 80 per cent of the animals surviving on the basal diet for a period of sixty days or more after withdrawal of the carcinogenic agent.

The incidence of liver cancer in animals maintained on the unpolished rice-carrot basal diet supplemented with varying amounts of brewers' yeast has been studied, and the results are exceedingly interesting. The addition of 15 per cent of yeast to the

rice had a distinct protective effect against the pathologic changes leading to the development of liver cancer. All of the yeast-supplemented animals examined between one hundred and two hundred days after the beginning of the administration of the diet plus butter-yellow had smooth and practically normal livers, grossly and microscopically. On the other hand, all of the rats fed the butter-yellow rice diet without the addition of yeast and examined on the one hundred and fiftieth days showed typical liver cancer. The inhibitory effect of yeast feeding upon the production of liver cancer was distinctly diminished when the diet contained less than 15 per cent yeast. With the addition of 6 per cent yeast, 40 per cent of the animals had normal livers, 30 per cent had cirrhotic livers, and 30 per cent had livers with a few tumor nodules, when examined on the one hundred and fiftieth day. With the addition of 3 per cent yeast, 30 per cent of the animals showed no malignant changes in the livers and 70 per cent had livers with cancer nodules.

A similar experiment was made with dried beef liver. The results were found to be in general agreement with those obtained with yeast. Thus, it seems evident that both yeast and dried beef liver contain a substance or substances which are inhibitory to the development of liver cancer produced by feeding para-dimethylaminoazobenzene.

Rice is poor in vitamins and low in protein. Therefore, in order to determine whether the protective effect of yeast and liver is due to the correction of a specific dietary deficiency or deficiencies, the effect of various vitamins with or without the administration of casein has been investigated. The daily oral administration of 20 micrograms of riboflavin and 2 g. of casein, which was sufficient to promote normal growth in young rats, was without a significant protective effect. However, when the daily consumption of riboflavin was increased to 200 micrograms, the protective effect was striking, though not complete. From a liver cancer incidence of 70 to 80 per cent, when

either riboflavin or casein alone was employed, the figure decreased to 3 per cent. Other compounds, either members of or closely associated with the B-complex group of vitamins, or the combination of cystine and choline, exerted a similar protective effect. Experiments have also shown that the production of liver cancer under these experimental circumstances is definitely reduced by the oral administration of other foodstuffs such as dried kidney, dried spleen, wheat, rye, millet seed, milk and hydrogenated coconut oil. However, a combination of casein and riboflavin, or a diet containing brewers' yeast or dried beef liver is more effective than these other foodstuffs. Surprisingly, biotin, rice bran concentrate, corn oil and commercial hydrogenated cottonseed oil exert a procarcinogenic effect.

The protection against liver cancer formation by yeast or liver is apparently temporary rather than permanent. Rats maintained on a butter-yellow rice diet and 15 per cent yeast for two hundred and eighty to three hundred and fifty days had a 50 per cent incidence of liver cancer. The incidence of cancer after four hundred to seven hundred days was 75 per cent and at eight hundred days was 85 per cent.

If the preliminary feeding with butter-yellow exceeds eighty-five days, liver cancer develops in 100 per cent of the cases, even though dietary anticarcinogenic yeast, liver, or milk is fed for long periods of time after the butter-yellow ingestion. Thus, once adenomatous hyperplasia of the bile duct, cholangioma, or hepatoma is established in the liver these benign and malignant tumors cannot be successfully treated with yeast, liver, or milk.

In summary, these experiments illustrate clearly that various dietary factors affect the development of experimentally induced liver cancer. Certain food elements prevent tumor growth, whereas others stimulate such growth. However, once a cancerous condition has been established in the liver it is impossible to re-establish a normal phys-

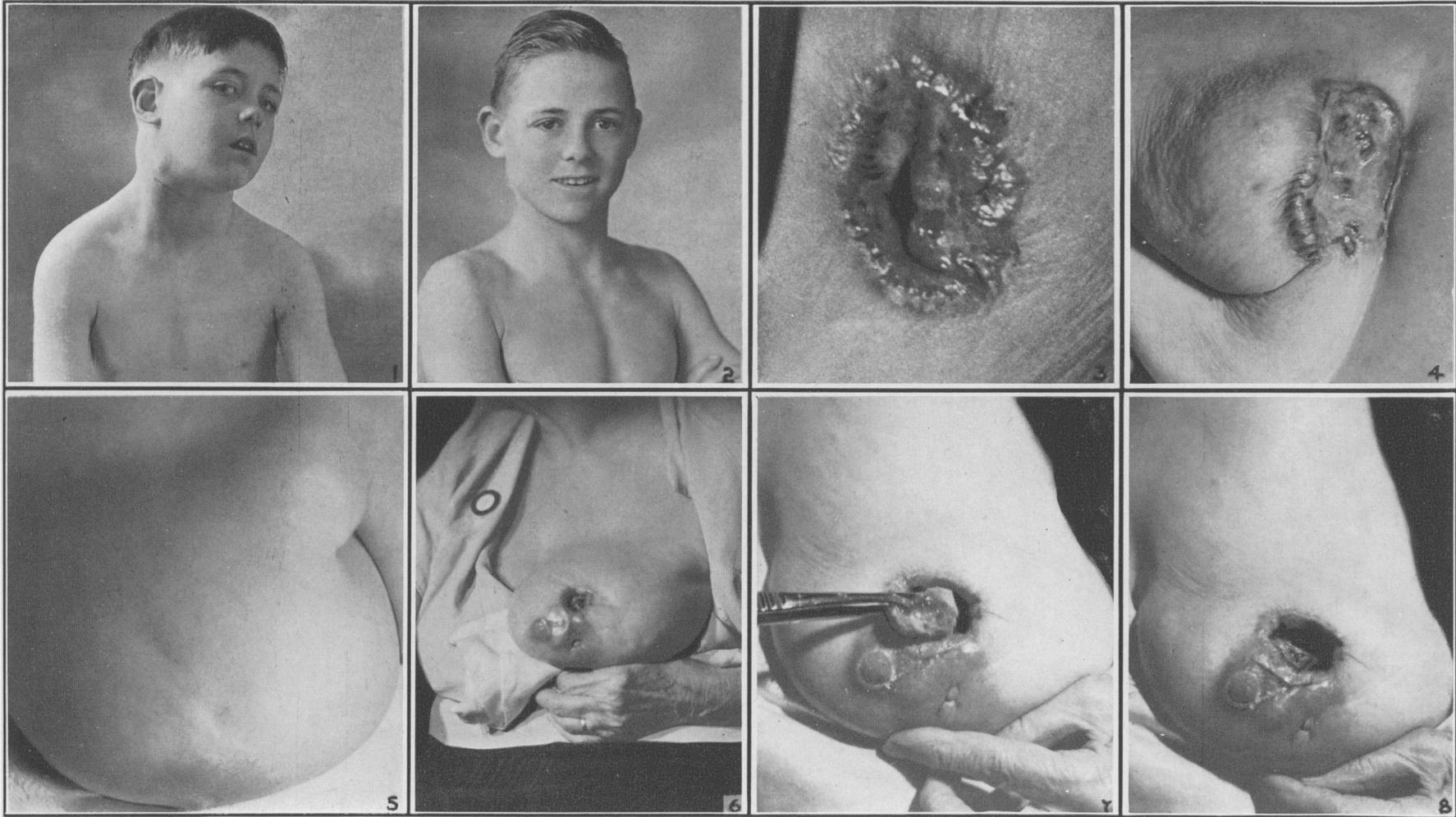
iologic state by means of a diet which would prevent or greatly delay the formation of liver cancer.

It must be admitted that the factors concerned in the development of cancer cells resulting from a combination of dietary deficiency and a carcinogenic agent, are poorly or not at all understood. Likewise, the mechanism by which good diet prevents or delays the development of such experimentally induced cancer is not understood.

The significance of these studies in relation to the development of primary hepatomas in man is not known. However, it is extremely interesting that the incidence of such tumors in well-nourished populations is extremely low, whereas in poorly fed, rice-, corn-, and millet-eating peoples of the world the incidence of such tumors is relatively high (*Nutrition Reviews* 9, 225 (1951)).

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Figures 1 to 8

CASE 4

Mrs. McD. Age 50 years. Weight 153 lbs. Blood pressure 114/80.

Past history.—Pleurisy and neuritis, otherwise negative.

Family history.—Negative for cancer.

History of present illness.—In 1933 noticed a lump in right breast. Had various simple types of treatment with no effect. The lump kept increasing in size.

Examination September 29, 1939.—Reveals a fairly well nourished woman but she states that she does not feel well, and that she lacks energy and easily tires. There is a hard mass in the right breast, with an opening towards the inner side with a polypus protruding, and a constant discharge, and quite a number of enlarged glands found in the right axilla. This patient was given treatment for a few weeks, and had the breast and glands removed October, 1939. Biopsy showed carcinoma of the breast. She continued her treatment. In this experimental work the idea of giving treatment before the operation is to endeavour to raise the resistance of the patient so that she may be in a better condition to stand the operation, and when the growth is removed it shortens the recovery time of the patient to normal health.

March 15, 1941.—No sign of recurrence of the disease, weight 157 lbs., and enjoying perfect health.

August 18, 1941.—Weight 150 lbs. Blood pressure 116/78. The patient is in good health. There has been no recurrence of the disease, and no complaints. She states that she does all her own housework and looks after a good sized garden.

CASE 5

Mrs. H. Age 50 years. Weight 173 lbs. Blood pressure 156/160.

Past history.—No serious illnesses.

Family history.—Negative for cancer.

History of present illness.—In 1936 she noticed a lump in the right breast which kept increasing in size. She had it removed December 2, 1938, by operation. Biopsy showed cancer. She enjoyed good health until January, 1941. Then she began to feel generally miserable, her physical energy going down. She was quite active in social affairs but had to give them up and was unable to do her ordinary house work.

January 16, 1941.—Examination: revealed a fairly well nourished woman but seemed lacking energy. X-ray of chest for metastases was negative. She was given an appropriate diet with extra vitamins and to report later.

March 19, 1941.—Patient's general condition much improved, weight 175 lbs. She appeared much more active and stated she was feeling much better and was taking part again in her social affairs and could do all her own house work.

August 30, 1941.—This patient, on leaving for her home in an Eastern Province, March, 1941, stated that if any unfavourable condition should arise regarding her ailment, I would soon be made aware of such. Not having heard from her, I am unable to give a further report of her condition at this date.

CASE 6

Mr. S. Age 55 years. Weight 198 lbs. Blood pressure 126/80.

Past history.—No serious illness.

Family history.—Brother died from cancer of the lip, age 54 years, 1907.

History of present illness.—In 1933 a sore appeared on the lower lip, close to the left angle of the mouth, which would not heal and kept increasing in size. The local doctor removed the growth by operation in November, 1933, and the biopsy report was epithelioma. He then received radium treatment, December, 1933. He states that he had no further trouble until June, 1940, when a new growth appeared a little toward the inner side of the old scar.

October 15, 1940.—General examination negative and health good. There was a growth the size of a bean on the lower lip, a half inch internal to the old scar, with a hard base and an adherent scab. Patient refused operation or any cutting, not even for biopsy. This patient is a farmer, necessitating his presence at home. He was given a diet supplemented with extra vitamins, and has continued to appear periodically for examination and observation.

January 11, 1941.—Weight 200 lbs. The growth is one-half its former size with recession of the hardened tissue, and he states that he has much more energy.

April 12, 1941.—Weight 206 lbs. Blood pressure 124/80. He states that he is enjoying the best of health with no complaints. There has been a marked recession of the growth since last examinations.

August 18, 1941.—Weight 199 lbs. Blood pressure 138/80. This man is strong and robust, full of energy and enjoying good health. He states that he is doing two men's work on the farm as it is impossible to get help. The growth on the lip has completely disappeared. The tissue of the lip appears quite normal. I had to be shown where the growth was by a depression in the skin, the size of a pin head.

CASE 7

Mr. S.S.C. Age 50 years. Weight 143 lbs. Blood pressure 128/88.

Past history.—Patient was never robust and his general health varied. Complained of considerable stomach trouble.

Family history.—Father and mother died of cancer.

History of present illness.—In 1933 noticed a sore on lower lip which kept increasing in size. He had it removed by operation October 28, 1939. Diagnosis by biopsy, epithelioma. In less than five months nodules appeared beneath the left jaw and in the surrounding tissue.

May 7, 1940.—General appearance, thin, emaciated and showing little energy. The submaxillary gland enlarged to the size of a large plum and a number of smaller glands in the surrounding tissue. He was given the usual treatment for a few weeks and the glands were removed by operation May 28, 1940. Biopsy report of enlarged gland showed a large epidermoid carcinoma with degeneration. Treatment was continued. He has made a good recovery.

June 2, 1941.—No sign of recurrence of the disease and he states he is enjoying better health now than he has for many years, with no stomach troubles.

August 20, 1941.—Weight 142 lbs. Blood pressure 126/84. General health and energy continue to remain good—no complaints and no recurrence of the disease.

CASE 8

W.R.S. Age 50 years. Weight 154 lbs. Blood pressure 120/80.

Past history.—No serious illness but complained of stomach trouble periodically.

Family history.—Mother, brother and sister, each died of cancer.

History of present illness.—In March, 1940, he stated that he began to feel his health slipping. His work instead of being a pleasure was a burden. He consulted several local doctors but his health kept gradually going down. Some of the leading medical men in the United States and Canada were then consulted, and he states that, after fluid was taken from the right side of the chest, and a piece of tissue removed from the growth in the bronchus of the right lung for biopsy, he was informed that he had cancer of the right lung, grade 4. He was given x-ray treatments and allowed to go home.

November 26, 1940.—This patient came to my office and seemed quite ill and from his history his health was progressing rapidly downward. Walking from his hotel to my office, just across the street, there was noticed marked dyspnoea and he had to sit and rest for a few minutes before he was able to talk with ease.

December 2, 1940.—X-rays were taken of the chest and hereafter at times when changes in his general condition warranted such, as this seemed to be the best method of observing any changes taking place in the diseased lung. X-ray report showed changes in the right lower lobe with a definite mass, about the size of a large orange, rather close to the hilum. This suggests a new growth.

He was given the usual treatment with little or no change in his condition for some weeks. Then he became quite ill and was confined to his bed with a temperature ranging from 101 to 102.5° and râles found throughout both lungs. I increased the treatment as far as I deemed it safe and after six weeks he began to show symptoms of improvement. Weight at this time, February 21, 1941, was 143 lbs. Since then there has been a gradual improvement in his general and physical condition.

March 2, 1941.—Weight 152 lbs. X-ray report: the left lung is clear. The right diaphragm is obscured. Changes are seen in the right lower central area. These changes are dense and suggest a new growth rather than a septic process.

Comparing this film with the one made three months ago, this mass remains about the same in size. The changes previously seen in the right lower lung field towards the periphery have now disappeared.

June 2, 1941.—Weight 156 lbs. X-ray report: single postero-anterior film was made of the chest. Comparing this film with that made three months ago, the infiltrative changes in the lower lobe have disappeared and the mass has not increased in size.

The patient is bright, active, and interested in attempting to do something to pass the time. He states he now can walk 4 to 5 miles without experiencing any sign of his former distressed symptom of breathing. This statement I believe to be substantiated by the findings of the x-ray plates taken of the lung December 2, 1940, March 2 and June 2, 1941. It would seem from this, that, in place of the disease progressing, it is retarded, with recession of the diseased condition in the lung taking place, with his health apparently, slowly, but gradually improving.

June 28, 1941.—He was allowed to go to his home in an Eastern Province, continue his treatment, and return later for further observation.

August 11, 1941.—Weight 155½ lbs. Blood pressure 118/78. Apparently this patient's general health and energy seems to be gradually improving. X-ray report: single postero-anterior film was made of the chest. Comparing this film with that taken on June 2, 1941, there is possibly some very slight improvement in the changes seen in the lower portion of the right chest.

I consider this patient is being rewarded with an improvement in his general health, and with a gradual recession of the disease by the exact and persistent manner in which he is adhering to his treatment.

CASE 9

W.T. Age 45 years. Weight 128 lbs. Blood pressure 128/82.

Past history.—No serious illness.

Family history.—No trace of cancer.

History of present illness.—In 1930 the patient noticed a little spot on the left side of the nose. In 1936 it broke down leaving an open, ulcerating sore with hard nodular tissue developing round the edge of the sore. He had a variety of treatments. He consulted a doctor who told him he had cancer and ordered x-ray treatments. He had x-ray treatment in the fall of 1938 and the spring of 1939 which relieved the condition for a few weeks. Then it returned and kept increasing in size. He felt his general health going down.

January, 1941.—Examination showed a man slightly below the average in size, pale appearance as though his general health is below par. General examination negative. There was a growth on the left side of the nose, the size of a medium-sized strawberry, with an ulcerating cavity in the centre, with hard nodular tissue

surrounding the cavity with an opening through into the left nostril, the size of a lead pencil. This man is working in an industrial business, and it is necessary that he continue his work. He was given the usual diet and extra vitamins for a few weeks. Then it was arranged that he come in once a week for hypodermic injections of embryonic tissue extract.

August 14, 1941.—Weight 127 lbs. Blood pressure 126/80. General health, good. This patient states that he feels more like working now than he has for some time past. The hard nodular tissue of the nose has disappeared, and the opening into the nostril is covered by a scab with apparently normal tissue healing in from the edge.

In this experimental study of human malignancy, I have endeavoured to obtain as varied an assortment of cases as possible regarding location of the original focus in the body. This variety of cases is of help in formulating some kind of a general method of treatment.

In my general practice I have been adopting the following method with my patients.

1. Cases that have no family history of malignancy: I arrange a simple, appropriate, natural diet, high in regulated vitamin content, to be taken as the main diet continually, in an effort to prevent the development of the disease.

2. Patients that give a family history of malignancy (susceptible cases): these are given a diet plus extra vitamins regularly throughout the winter months, and periodically in the summer months, depending on the family history and general condition of the patient, as each case is a study in itself.

3. Cases where symptoms of the disease are already present: these are given a diet plus extra vitamins plus embryonic tissue extract injections for a few weeks with the idea of raising the resistance of the patient. The growth then is removed by operation if it can be done safely. The treatment is then continued for a *time*, the length of *time* depending on the extent of the disease and the general condition of the patient. Further experimental study and experience will be the answer to the length of *time*.

4. Advanced cases, and those of long standing: usually these have had a variety of treatments. Most of these are like some other diseases in the terminal stage; little can be done for them.

I present here some observations and conclusions from my limited experience in attempting to treat a few cases of group 4.

My first objective is to attempt to retard further development of the progress of the disease; this is long and, at times, discouraging to both patient and physician but persistence in treatment is often rewarded. Eventually, in those that respond there is an improvement in

general health and physical condition, with alleviation of the distressing symptoms.

1. In the case of those patients where the symptoms or growth is external: there is of course, the opportunity of observing the changes that take place, from time to time, in the abnormal tissue. The degeneration of the hard nodular mass with a serous to a sero-sanguineous fluid discharge, probably from the necrosed abnormal tissue, may in those cases be readily observed.

2. In the case of those patients suffering from the disease internally I have observed that they periodically develop symptoms resembling those of a toxic nature, which symptoms and attacks lessen as their general health improves.

My thanks are due to Mrs. Jean McTavish and Edith Hodgkinson for their clerical assistance, Drs. Wheeler and Edminson for the x-ray plates, and William Gould for the photographic work, and those who, in different ways, have assisted the work.

REFERENCE

1. DAVIDSON, J. R.: *Canad. M. Ass. J.*, 1939, 41: 223.

RÉSUMÉ

Un régime alimentaire simple, approprié, naturel, bien équilibré et riche en vitamines semble avoir les meilleurs effets sur le cancer humain, comme le fait fut observé chez les souris atteintes de carcinôme dû au goudron. Neuf cas sont rapportés qui paraissent prouver objectivement et subjectivement l'efficacité de la cure. Chez les malades à ascendance cancéreuse et chez ceux qui sont porteurs de lésions d'allure très maligne on ajoute au régime spécial l'apport de vitamines additionnelles du commerce. La question de la durée du traitement est encore à l'étude. Les cas désespérés ont bénéficié jusqu'à un certain point de ce mode de traitement.

JEAN SAUCIER