ever looms before his vision the seductive stock-in-trade of the advertising quack, which invariably contains a certain cure without the knife. The medical man, therefore, becomes in a large number of cases the *dernier ressort* of the cancer-stricken patient. The circle is maintained in all its viciousness, ignorance of the possibility of cure and of the conditions governing it and fear of receiving a sentence of death, leading to procrastination, which itself is the cause of the impossibility of cure. In addition, the early manifestations of cancer are apparently so harmless that the sufferer has every inducement to believe what he hopes, and what his friends, if he consults them, are sure to tell him: that his ailment must be a trivial one.

These are the chief causes of delay among educated people who know something of cancer and its common situations. Among the poorer and less educated classes unadulterated ignorance plays the greater share. They do not commonly regard anything which causes no pain or feeling of illness as of any consequence whatever, and these symptoms are conspicuous by their absence in early cancer. The everyday reply of the poor at hospital, with advanced cancer of the breast, uterus, and even tongue, to the question, "Why did you not apply sooner?" is, "As I felt well and suffered no pain, I did not think it could be anything serious," "I thought it was only a cold," or something equally absurd. It is manifest that such a state of affairs can only be dealt with by improved education, and by this is understood not an attempt to make of the public amateur doctors, judges of their own complaints and of their own symptoms, but a dissemination of knowledge in the following two particulars: first, in that of the possibility of cure in early cancer; and, secondly, in that of the fact that early cancer produces no symptoms of pain or ill-health, and that in the latter half of life any deviation from normal health in certain organs—to wit, the mouth, digestive tract, uterus, and breast, must carry with it the determination to immediately exclude or confirm cancer, if the patient means to make a bid for his life. It is very little to know. In the case of other diseases, such, for instance, as typhoid fever, tubercle, etc., plain facts, requiring no medical training, have become common property, and are acted upon to their advantage by the educated public. There does not seem to be any *a priori* reason why similar and just as simple knowledge should not be disseminated with regard to cancer. In my recent book, *The Control of a Scourge; or, How Cancer is Curable*, I have endeavoured to instil into the public mind in regard to this disease a view more hopeful and more consonant with the generally accepted opinion among modern surgeons of the possibility of cure in early cancer than exists to-day; and I have adduced evidence to show that this opinion has a convincing foundation in actual practice. I have indicated there some of the lines on which education in this matter might, in my opinion, be put a step further. The general practitioner, who is constantly in touch with the public, has the largest opportunity of helping education forward, and he should lose no occasion of impressing upon his patients the cause of the generally fatal character of cancerous disease, and of the possibility of securing vastly better results in its treatment than do actually obtain at the present time. Then it is obvious that medical and surgical nurses might easily be equipped with the knowledge of these elementary facts about cancer. They are almost as ignorant as lay women. Not only have I witnessed the experience of nurses themselves applying with advanced and inoperable cancer, but conversations with them in hospital have demonstrated that they regard cancer as inevitably fatal. This is not to be wondered at when we consider the numbers they see who perish of it in our hospital wards, and that those in whom the disease does not recur after removal escape their subsequent cognizance. Owing to its sites of election in women, nurses are no doubt frequently consulted by their own sex about early cancer, when from readily intelligible motives the patient hesitates to approach a medical man. It is essential, therefore, that their knowledge should be accurate, and the necessary information could be easily imparted to them by including in their syllabus of lectures one on the elementary facts of this disease. Midwives might be similarly instructed. They are brought daily into close contact with the ignorant classes, the most difficult of all to get at, and they no doubt are consulted frequently on matters outside their immediate calling, amongst others on early cancer. Their information, therefore, should also be accurate, and in like manner there would be no difficulty in including in their repertoire a little elementary knowledge of cancer. We might reasonably go even a step further in our endeavours to lighten the load of cancer mortality. Lectures might easily be provided for clergymen, clergymen's wives, district visitors, and those generally who are constantly in touch with the poor and ignorant classes on this subject as well as on others in which the possession of accurate knowledge would furnish the means of rendering valuable assistance in the saving of human life. Such lectures have long been in vogue to provide for surgical emergencies where skilled assistance is not immediately to hand. We might anticipate far more tangible results from a similar spread of information in regard to those diseases in which ignorance of the most elementary facts leads to disastrous and irremediable consequences. Among such none plays a more conspicuous part than cancer. The above are some of the means whereby might be substituted sound knowledge for the despair and ignorance which hold the public in their grip, and it cannot be questioned that there would result an appreciable control of the ravages of this deadly disease. Until education has been tapped our present means, and at present our only means, of dealing with cancer have not been exhausted. In conclusion, it may be safely asserted that the early recognition of cancer will not be a matter of indifference whenever, if ever, the cause of this disease is discovered and methods more scientific than eradication by the knife are found for dealing with it; for it is not to be supposed that whatever means the future may have in store for combating this disease, it will be a matter of no importance whether, for instance, a woman suffering from cancer of the breast presents herself for treatment when the disease is early and limited or when she is the victim of its later stages, with secondary deposits in the thorax and liver. At all events, there are abundant reasons now for an endeavour to bring the lay knowledge of cancer into line with present surgical views of it, and to convince the public that a considerable share in the possibility of cure rests with them, and that it varies inversely with the delay in seeking advice.

## A CASE THAT SEEMS TO SUGGEST A CLUE TO THE POSSIBLE SOLUTION OF THE CANCER PROBLEM.*

BY CHARLES GORDON MACKAY, M.B., C.M.

THERE can be little doubt that occasionally a true cancerous tumour comes to a pause in its growth, when it seems in fact to have lost its power of further attack on healthy tissue, and then a cure, more or less complete, is said to have taken place. When this has happened it is reasonable to suppose that some agent must have been at work either as aiding the body tissues in their resistance to attack or acting in antagonism to the cancer cell and so diminishing its invasive vigour. If there be such an active agent, what is it? Is there possibly elaborated in the body of the patient a something which can act in this way and so effect a spontaneous cure? A case has been recently under my care which seems to suggest an answer to this question.

Miss X. Y., aged 37, had a typical mammary scirrhus in the autumn of 1904. I first saw the case early in October and diagnosed carcinoma. Some weeks later the case was seen by my friend Dr. Bruce, Dingwall, who was of the same opinion. She immediately went to Edinburgh and entered the Deaconess Hospital, where the tumour was removed by Mr. Alexis Thomson. Thirteen months after the disease recurred and in such a form as to render a second operation inadmissible and *x*-ray treatment was recommended and used for some time. The other breast became involved, a troublesome cough came on, and later pleurisy, first in one side and then in the other.

Since this paper was read I have received, by the kindness of Mr. Thomson, a copy of the hospital report, from which I have extracted the following:

*Read to the Northern Counties of Scotland Branch on March 1st, 1907.

Miss —, 37 years of age, admitted Deaconess (Hospital) November, 1904. She had noticed a lump in the right breast since April, and had seen Dr. Mackay, of Lochcarron, and Dr. Bruce, of Dingwall. She was in very good health.

There was a circumscribed cancer in the outer quadrant of the right breast, adherent to the skin, and nothing was to be felt in the axilla The complete operation was performed on November 4th, 1904; the axillary glands were infected but there was nothing at the operation to show that the case was specially unfavourable. She made a good recovery and went home.

The microscopical diagnosis was the common form of scirrhous cancer. On January 9th, 1906, she showed herself again. There were small fixed nodules in the scar, a large fixed one below the clavicle, and there was bulging of the sternum. As it was quite out of the question to operate she was put on a course of the $x$ rays, and these were pushed to the extent of reddening and scaling of the skin. The result was that the progress of the disease seemed to be arrested.

She returned to the hospital in August, 1906, for another course of $x$ rays. The disease had again made progress after the manner observed in recurrent cancer of the breast. She had an irritating cough, which was regarded as being due to pressure on the recurrent laryngeal nerve, and there was a marked degree of breathlessness and dullness over the pleural cavity on both sides.

On the first occasion on which she was tapped 40 oz. of blood-stained fluid were drawn from the left pleural cavity, and 10 oz. of similar fluid from the right; after the tapping there was dullness up to the lower angle of the scapula on both sides, and there was also dullness of the right apex. A fortnight later 28 oz. of blood-stained fluid were drawn from the left pleura. The breathlessness returned. An attempt was made to tap the left pleural cavity, but only a few ounces of blood-stained fluid were drawn off. It was inferred that the dullness was now mostly due to thickening of the pleura and consolidation of the lung, due to metastasis of the cancer. She gradually failed in health, and made up her mind to go home (November 8th, 1906). In his covering note Mr. Thomson says: "The diagnosis of cancer was based on the usual complete microscopical examination of the tumour of the breast and of the glands. There is absolutely no doubt of the disease being cancer."

The patient came home from the hospital on November 8th last in a hopeless condition, and for several weeks in December her state was one of semi-collapse. The disease then was evident by a deep blue discoloration over the whole front of the chest from the clavicles to a line a little above the level of the upper margin of the liver. The left breast was of great size and hard. The left axilla was obliterated, filled with malignant growth. In the right axilla matters were much the same, though not quite to the same extent. Both sides of the chest contained fluid almost to the clavicles. The respiration was 44. Swallowing anything, even a teaspoonful of water, was difficult, and sometimes impossible.

This state continued up to and including December 27th. On the morning of December 28th it was found that the condition had entirely altered. She was much better and felt comparatively comfortable. She could swallow quite easily. The respiration had fallen from 44 to 24. The fluid in the chest was in greater part gone. She gradually took food in fairly good quantity and improved in every way. Still more remarkable was the fact that the seat of the local disease (the front of the chest) gradually underwent a change for the better quite as great as in the general condition. In its whole extent the deep purple discoloration became very markedly lighter. In some places the skin regained its original whiteness and where it had been tensest and shining it became at first wrinkled and then flaccid.

The diseased parts that had not been treated with the $x$ rays have undergone an extraordinary change. On the left side the breast, which had grown to a large size and felt hard, has absolutely disappeared with the exception of a circular flat disc the size of a sixpence, fully $\frac{1}{4}$th of an inch thick, brown-yellow, and of horny consistence and appearance, which occupies the place where the nipple had been. There is no trace of a gland and where it had been the skin is flat and close to the ribs. The left axilla, which was full of cancerous growth, is now a cavity into which I can place my closed hand. In the right axilla there is a similar result.

The space where the right breast, which had been excised, had been and the parts adjacent had all been subjected repeatedly to $x$-ray treatment, and here the improvement though quite as decided has gone on at a slower pace. Though there is healthy action, the tissues seem to be in a semi-paralysed state. The $x$ ray has not been elective in action. It has affected the disease and the healthy tissues in equal degree.

The cough, which had never been absent for ten months, ceased on a certain day, January 6th, and has not been heard once since. Up to this date, February 11th, there has been steady improvement in every way. Morphine, of which $1\frac{1}{4}$ grains was the routine dose for some time, was gradually reduced, and lately stopped altogether. For the last week the only anodyne needed was sulphonal—15 grains at night.

What is the meaning underlying this? What really took place? The patient had been in a half starving condition—starved of food and of water—a state most favourable to the absorption of a thoracic exudation. When absorption took place pressure was taken off the oesophagus and swallowing became possible. The same cause relieved the lungs, and the respiration fell to 24. Improvement, not only general, but also local, coincided exactly in point of time with the disappearance of fluid from the chest. How did this affect the cancerous tumour? Let us consider the facts as they appear, and then endeavour to account for them. The fluid (serum) had been suddenly, rapidly, and in considerable quantity taken into the system. It thus came into contact with a malignant growth which at that moment was overwhelmingly master of the situation. Be the cause what it may, the sequel was that thenceforward the growth not only ceased to advance, but actually withered and steadily parted with the most marked features which constitute its character. To the onlooker seeing this day by day it appeared as having only one meaning. There was hardly escape from the conclusion that these two things stood related to each other as cause and effect.

It seems certain that in this instance there was some powerful agent at work which in a very short period of time produced a profound effect on cancerous growth. What is the agent? Judging by this case alone, the active something, whatever it be, seems to be in the serum. That is the conclusion I feel driven to, founding on the clinical evidence in the case, and it acquires additional force from the fact that it is in harmony with opinion founded on results obtained by experimental research. There is a very large mass of evidence of this kind which almost conclusively proves that the serum contains something which is antagonistic to malignant growth. What say the great experimenters? Their names (Clowes, Ehrlich, Gaylord, Bashford, Beebe, Ewing, Jensen, and others) are known, and many of them, it is not too much to say, are master spirits. What say they? Practically, they voice one note on this point. Dr. Clowes of Buffalo, U.S.A.[1] says that experimental research with mouse cancer goes to prove that a growing cancer produces in the serum a force which is antagonistic to the development of cancer.

Does it not appear almost certain that this spontaneous cure I have recorded may be due to such an agency? Bashford and Clowes[2] are of opinion that the body fluids of some protected mice when injected with experimental cancer have given indication of a power to retard the growth of well-established tumours. Ehrlich[3] says haemorrhages are associated with retrogression of tumours.

In other words, does not this mean that serum causes a tumour to retrograde? Ordinary healthy serum offers some resistance to cancerous growth, but this resistance is partial and ineffective. As the strife goes on the progress of the malignant disease is accompanied by the formation in the blood of an antibody, a virus. This virus is the child of the cancer cell. In the blood vessel, that is, while it forms a factor of the blood, it is inert; outside the vessel it may become all-powerful. A question arises, Does this virus, as such, exist at all in the blood, or does it date its existence from the moment the serum which forms its vehicle separates from the other blood constituents?

If this latter view be correct, then the first thing formed might be a ferment only, but which had the power of forming the virus at the moment the serum parts company with the blood. Whichever it be, the fact of practical importance is, that under some circumstances, did we but have the gift to see it, the child of the cancer cell turns on the parent and destroys it.

Surely this has practical bearings. My patient would certainly have died nine weeks ago but for the pleural fluid which was an accident, not an essential element of the main cause. By that fluid she was inoculated, if I may so describe it, and the inoculation saved her life. Speaking on the principle involved, apart from questions of method, it is pertinent to ask: "Could not that inoculation have been done artificially?" The developments in this case are full of suggestiveness.

Is it too visionary to entertain the hope that a method founded on imitating what appears to have taken place in this case may eventually be possible? I think it no dream. There is at least some evidence which goes to show that when the disease is in the form of recurred nodes a serum can be used which appears to cause increased activity in the region primarily occupied by the disease, but which has decided effect on the node. The

results are a marked diminution in size, with disappearance of the attachment of the node to the skin and to the underlying tissues, and ultimately almost complete freedom from pain.

The latest Bradshaw lecturer[4] has expressed his confident hope "that the final victory over cancer will not solely be by the knife." I am a sharer in this confidence, and feel certain that the victory will ultimately be by a serum.

REFERENCES.
[1] BRITISH MEDICAL JOURNAL, December 1st, 1906, p. 1553. [2] Ibid., p. 1560. [3] Ibid., p. 1552. [4] Owen, ibid., December 15th, 1906, p. 1687.

## INFLAMMATORY CHANGES IN POSTERIOR SPINAL ROOT GANGLIA IN CASES OF CUTANEOUS CANCER.

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IN the BRITISH MEDICAL JOURNAL, April 13th, 1903,* I pointed out that the spread of cancer in skin was associated with degeneration changes in the posterior spinal root ganglia which supplied the area invaded, and I described the changes observed. These intracellular changes were not observed in the corresponding ganglia of the opposite side, which were in marked contrast to them. In the article to which I have referred I did not demonstrate inflammatory changes within the ganglia in question. In the present article I publish 2 cases in which cancer had begun on the cutaneous distribution of one ganglion and spread into the cutaneous distribution of its neighbours, yet it is only in the ganglion on the distribution of which the cancer had begun that inflammatory changes can be seen, whilst the ganglia into whose cutaneous distributions the cancer had spread showed the changes of degeneration to which I referred in my paper of 1903.

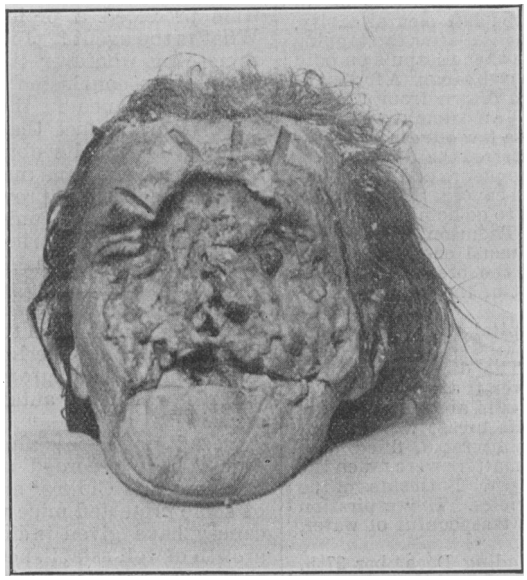

Fig. 1.

### CASE I.

The head of a woman, aged 71, who had a rodent ulcer on the face for about thirty years, is shown in Fig. 1. The disease began on the left side of the nose near the inner canthus, and spread on to the right side of the face. Pain was of a very marked, severe, and uncontrollable nature.

### EXAMINATION OF THE GASSERIAN GANGLIA.

The right Gasserian ganglion is normal except for the intracellular degeneration which existed in the ganglion cells. There is no sign of inflammation in the ganglion and parts with which it is surrounded. The left Gasserian ganglion is enclosed in a very thickened capsule, and between the ganglion cells there is a marked inflammatory change. Here can be seen an infiltration of polynuclear neutrophile leucocytes and an accumulation of lymphocytes. There is no haemorrhage, but a great deal of intracellular degeneration change in the ganglion cells. There is no inflammatory change to be seen in the membranes surrounding the ganglion. The pituitary body, which was also microscopically examined, was normal.

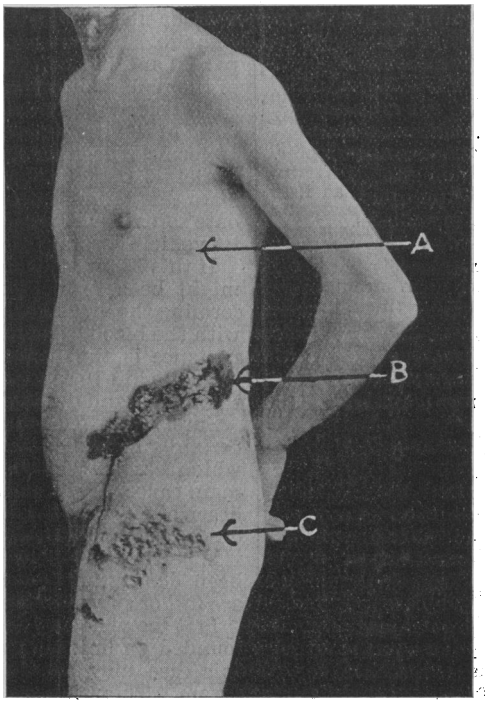


Fig. 2.—A, Secondary deposit to tumours at C; B, "Paget's disease of the nipple"; C, squamous epithelioma.

### CASE II.

Fig. 2 is the photograph of a man, aged 52, who had been a porter for thirty years, and whose duty it was to load carts for certain stores. He could not associate any mechanical or other irritation with the seat of his lesions. There was no history or evidence of syphilis, although in the microscopical examination of his posterior spinal root ganglia changes can be seen in the walls of some of the blood vessels, which suggest that syphilis may have been their cause. Agonizing pain, which was very difficult to relieve, was the chief complaint of this patient. In the photograph two lesions (B and C) are to be seen on the left side. They are quite distinct from each other, clinically and microscopically; B has all the characteristics of "Paget's disease of the nipple." At the time when the medical societies were meeting the patient was too ill to be moved, otherwise I would have shown him. Dr. Arthur Whitfield came to see the case with me, and he diagnosed this lesion, clinically and microscopically, to be the same as Paget's disease of the nipple. I have shown sections to Mr. Shattock and Dr. Radcliffe Crocker, and they agree with that opinion.

The disease began four years ago at the point where the lateral branch of the eleventh dorsal nerve becomes cutaneous. There was no reason to suppose from the man's history or the situation that it began on a supernumerary nipple in this region. The disease spread mainly backwards and slightly forwards.

The distribution of this disease seen in the photograph is that of the lateral cutaneous branch of the eleventh dorsal nerve, but he remained in hospital until he died, four months after this photograph was taken, and during this time it spread backwards towards the spinal column, a little more forwards, but, so far as we could see, it did not spread upwards or downwards; so it practically covered the area supplied by the eleventh dorsal posterior spinal root ganglion. It is very similar to the distribution of the herpes zoster in Fig. 3 and of the morphoea at E in Fig. 4. And I have a case kindly sent to me by Mr. J. Sherren, in which the lateral cutaneous branches of the tenth and twelfth dorsal nerves are covered by leucodermia, whilst that of the eleventh dorsal nerve escaped and was free from leucodermia.

In most of the cases of Paget's disease of the nipple which I have seen in other parts of the body, the areas were peripheral, but when they affected the same region in different cases they, as a rule, occupied the same areas. I hope in some future communication to refer to the nature of Paget's disease of the nipple.

The lower lesion C, situated upon the upper part of the left thigh, is a squamous epithelioma which began eight months ago (three years and four months after the lesion B). It rapidly spread to the size shown, and diffused itself by appearing as apparently discrete herpetic looking spots down the limb, across the hypogastric region, and reached the upper part of the thigh on the opposite side. All these foci were squamous epithelioma. There was also

*Note upon a Possible Relationship between Carcinoma and Nerve and Trophic Areas.