example of what I am stating. After the brilliant results recorded by Sir Felix Semon at last year's meeting of the Laryngological Section of the British Medical Association from thyrotomy very few surgeons in this country, however well acquainted they may be with the results obtained from any of the newer methods, would hesitate to urge his patient to undergo immediate operation in the hope of saving the much more serious and dangerous operation of laryngectomy. Hence it comes that most of the cases at present selected for treatment by x rays, radium, or such agents are considered inoperable, and, thanks to early diagnosis and the number of men nowadays skilled in the use of the laryngoscope, these are few in number. The case which I am about to record was sent to me for treatment, and after carefully explaining matters to the patient the selection of the agent was left to me.

One reason for selecting this case was the fact that it was taking a step farther than in applying it in ordinary ulcerating rodent ulcer. The feature of this case was the local induration as well as ulceration. I had no doubt, however, as was proved afterwards, that by x rays the mass could be broken down and improved. The diagnosis clinically and microscopically was epithelioma. The patient was a man aged 78. Its history was that it began as a wart thirteen years before. After four or five years increased, but still slow growth took place, but one year ago signs appeared of rapid development. The ulcerated parts indicated the seat of the old wart. The skin was affected externally, and the new growth extended throughout the whole length of the ala. It was irregular in shape and more prominent anteriorly. For the most part the skin was unbroken, but there was an ulcer about $\frac{1}{2}$ in. in diameter on the point of the nose. The disease extended to the septum and passed inside the vestibule to a

Epithelioma of nose: A, condition before treatment, unaltered by radium bromide; B, condition at present after x -ray treatment.

distance of more than $\frac{1}{2}$ in., so that the mucous membrane was involved, particularly on the outer wall near to the inferior turbinated body. The specimen of radium applied weighed 10 mg. It was of great radio-activity, and had produced a distinct burn on the normal skin of the body which lasted for months, although it had only been applied for one hour and through a plate of mica. Nevertheless, the fact that it was applied first at a distance to the patient and then nearer and nearer until it was practically resting on the skin; that some of the sittings gradually increased in duration were over forty-five minutes; and that thirty-nine applications of radium bromide failed to produce the slightest change as far as I could detect, it was unfair to submit the patient to further trial, and x rays were commenced. As had been anticipated, the hard matter very speedily began to break down. An improvement was distinctly seen within a week. The application of the x rays was given at first daily and then at intervals. In all thirty-seven applications were given and in five weeks the treatment was stopped. The progress continued steadily without treatment for one month afterwards, and the parts inside and outside are now nearly well. In the first photograph the lesion is seen before any treatment was

applied, and the second shows its condition at the present day.

One's first conclusion about the failure of radium to do anything in this case might be that the x rays are superior to the emanations of radium; doubtless in this case they were, but the question arises Is it not one of degree? Had I had salts of greater radio-activity and a greater quantity of them, or had we been able to apply them longer, the result might have been different. The results in rodent ulcer lead one to suppose that this might be the case, and this leads me to another point which has often struck me when treating such diseases as rodent ulcer and epithelioma with any of these new agents, namely, apart from the class of disease, the patient's idiosyncrasies, and many other circumstances, there would seem to be a difference in response to treatment according to the state of the lesion at the time the agent is applied. When the parts are ulcerating or fungating, both of which conditions may in a sense be looked upon as the results of attempts on the part of the tissues to cast out disease, one seems often to get the quickest and afterwards a good result. Of course it has to be remembered in this connexion that as a rule the cases one gets for treatment are inoperable, and most of them are exactly in these conditions. Our experience of superficial tumours where the skin is unbroken is more limited so far.

I have noticed the effect of the breaking down of the tissues in more than one case of epithelioma when being treated with radium. At present I have a serious case of epithelioma of the fauces and tongue under treatment. The patient was sent to me as quite inoperable, the lesion being far too old and extensive. A large proliferating mass had a projecting part the size of a small nut, which was steadily growing, much to the inconvenience of the patient in swallowing, and it seems to have been arrested and is now breaking down. I have also observed the same thing in another case of epithelioma of the fauces at present under observation.

In trying to answer the questions raised at the beginning of this paper, from what I recorded in my previous communication published in the BRITISH MEDICAL JOURNAL in June of this year, and all I have since learned, it is evident that the salts of radium have a therapeutic effect. These results, in my experience, have been in lupus and rodent ulcer, for the most part as yet in limited lesions, and where the agent could be applied directly to the affected part. The indications would point further to its being useful in the same class of affections as are at present being treated with the x rays, Finsen light, or high-frequency currents. Thirdly, that the experiments, so far, do not justify comparison between the salt of radium and other agents; and, lastly, that what is wanted at present is further investigation into the physiological and other properties of the different radium salts. In pursuance of this I have tried to get salts of greater radio-activity and in much larger quantity, but no maker has been, so far, able to satisfy me upon the tests which I asked for, or to supply me with sufficient quantity.

REFERENCES TO THERAPEUTICS.

- Walkoff, *Photographische Rundschau*, October, 1900. Giesel, *Gesellsch.*, T. xxxiii, p. 3596 et *Naturforscherversammlung*, München, 1899. Gusseubauer, case shown to the Vienneese Imp. Acad. of Science, 1903. Goldberg and London, *St. Petersburg. medicinisch-chirurgischen Gesellschaft*, April 17th, 1903. Barrier, *Paris Académie de Science*, 1903. Delsaux, *La Presse Otolaryngologique, Belge*, No. 8, 1903. Cleaves, *Advanced Therapeutics*, November, 1903. Danlos, *Annales de Dermatol. et Syphiligr.*, 1902, pp. 156, 490, 620, 723. Hallopeau and Gadaud, *ibid.*, 1902, p. 720. Carez, *Annales de l'Electrothérapie*, January, 1902. Oudin, *Annales de Dermatol. et Syphiligr.*, July 3rd, 1902. Blandamour, *Thèse de Paris*, November 26th, 1902. Trémolières, *Presse Médicale*, December 13th, 1902. Danysz, *Acad. des Sciences*, February 16th, 1903; *Presse Médicale*, February 25th, 1903. Bohn, *Acad. des Sciences*, May 4th, 1903; *Presse Médicale*, May 13th, 1903.

ON THE TREATMENT OF CANCER.

By LOVELL DRAGE, M.A., M.D. OXON.

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THE satisfactory results obtained from the treatment of uterine fibroids by oil of cinnamon led to a speculation concerning the therapeutic value of the oil and its mode of action. This speculation dovetailed in, curiously enough, with a study of the conditions connected with the formation of blood clot in the veins of pregnant and lying-in women. As a result I was led to exhibit the oil in full doses in an inoperable case of cancer of the breast. Certain reactions were then noticed, and a woman whose breast I intended to remove because of the presence of scirrhus growth was in consequence of these observations placed under the influence

of the drug for a month before operation and for two months afterwards. The result was in every way satisfactory; there was nothing to notice except a strikingly rapid return to good health, which condition has remained for more than two years.

A paper by Dr. Batty Shaw, in the *Journal of Pathology*, on the leucocytosis which can be produced in cats by the intravenous injection of sodium cinnamate, gave me a clue as to the mode in which cinnamic acid acts therapeutically. It was therefore determined to obtain the co-operation of scientific chemistry. Dr. G. T. Morgan, of the Royal College of Science, South Kensington, very kindly consented to take up the subject, and very soon furnished me with a 10 per cent. solution of sodium cinnamate in glycerine, and with that I first worked.

It was early found that pulmonary tuberculosis was very easily and beneficially treated by the injection of 30 minims of this solution once a week. That in early cases a return to health could be guaranteed in two months' time, and that in all but very advanced cases the fibroid change in the lungs could be either initiated or hastened. This change is believed to be that by which Nature effects her cure.

It was found that, although this was the case, cancer was not so easily attacked; in the cases treated, secondary glandular growths readily disappeared, and, although the main growth was prevented from invading adjacent tissue, there was not complete cessation of growth. Enough evidence was, however, furnished to show that the lines upon which cancer was being attacked were correct ones.

As this appeared to be the case, Dr. Morgan pursued his work in the laboratory, and we decided to prosecute a search among the new allies and derivatives of cinnamic and salicylic acids, the extent of the latter appearing to open up possibilities of success. Dr. Morgan has supplied me with several compounds belonging to this group of substances, and these have been used at intervals of a week in varying doses.

Four injections of one of these solutions has caused the disappearance of what was diagnosed as a carcinoma of the breast in the cases of two women of about 40 years of age, one of whom was treated as long as seven months ago.

CASE I.

This patient, a nurse, when nursing a case for me consulted me about a lump in the breast, because she feared that she would be compelled to give up her work on account of the pain she suffered on the side of the chest where the growth was, and the increasing difficulty which the pain in the arm of that side caused her in moving patients. She absolutely refused operation of any kind, but consented to allow me to inject the solution, which I did between the growth and the healthy tissue three times before she left the lady she was then nursing. About six weeks later she came to see me, saying that the pain had practically ceased and that the growth had very much altered.

It was then found that the growth was no longer a dense hard mass deeply situated in the breast, but was a diffuse one, smaller in size than before; it was freely movable and close to the surface of the skin. A fourth injection was then given; about two months later the growth was very much the same in condition, only there was less compactness, and a fifth injection was administered. The patient was not seen again until about seven months subsequent to the first injection. She was at that time again nursing a case and suffering no inconvenience or pain; the growth then felt just like the rest of the mamma, only the trabeculae between the gland substance were harder and more defined than usual. The growth was considered to be arrested, and no further injection was given.

CASE II.

The growth in the second woman presented the same appearances after four injections administered in the same way; in this case, however, the patient had been previously treated by injections administered into the subcutaneous tissue of the abdominal walls. When I first saw her in May she was suffering from continual retching, occasional vomiting, and a feeling of discomfort in the belly; the belly was tense, and as I suspected from her appearance, and the signs and symptoms, that she had malignant disease of the upper bowel or of the pyloric end of the stomach, I placed her under treatment. The symptoms gradually disappeared, and the patient had so far improved that she left on a visit to friends in the middle of August. She returned at the end of September with oedema of both extremities and shortness of breath, in fact with signs and symptoms of heart failure. She was treated for this and improved.

Whilst examining her heart one day I noticed a hard lump the size of a walnut in her left breast; on questioning her I found that she had noticed it for some weeks, and that she thought that the pain which she had felt proceeded from it. Injections of the solution were given weekly for four weeks between the tumour and the healthy gland substance; all that remained at the end of that period was a thickening of the trabeculae of the gland.

These are cases which show what relief can be given in early cases of cancer.

CASES III AND IV.

Two late cases of carcinoma, one of the tonsil and one extralaryngeal, have given very decided evidence as to the alleviation which it is possible to afford in hopeless cases. In both cases, although there was a gradual increase of the mass growing from within, the growth appeared to be encapsulated; there was no invasion of adjacent healthy tissue, glands which were enlarged disappeared, and both patients died peacefully from exhaustion, the result of want of rest and difficulty in swallowing sufficient food. No other pain than that of discomfort connected with the difficulty in clearing the air passages of secretion and in swallowing food was experienced; tracheotomy was not necessary in either case, and there was absolutely no fetor in the discharges.

The relief given in the latter cases has impressed me very forcibly with the fact that the basis upon which the treatment rests is a correct one; the ability to give relief to such cases would certainly not have occurred to me at all if I had not already developed confidence in the method. At the Swansea meeting of the British Medical Association I had the advantage of a talk with my friend Dr. Lewis Jones, and it was agreed by us that a trial should be given of the treatment of cancer by cinnamic acid and its allies after the x-ray treatment had been pursued.

CASE V.

A man, about 50 years of age, consulted me with the history of a rapidly-growing tumour connected with the liver. He had already consulted both physicians and surgeons in London; the unanimous opinion being that the growth was malignant, and the days of the patient numbered. When I first saw him he was complaining of feelings of weight and oppression at the pit of the stomach, and on examination I found a very large growth obviously connected with the liver. Treatment was commenced; the symptoms from which the patient was suffering have been practically removed, and there is a very distinct alteration in dimensions in the direction of distinct diminution, and one in texture on palpation in that of contraction.

The case is still under treatment, so no more can be said at the present moment, but in view of the fact that there is a cessation in the growth of the tumour, noticeable even by the patient himself, and an alteration in the tumour itself which can be felt, I must confess to a belief in a result of some degree of success.

CASE VI.

In one case of recurrent cancer of the right breast the patient was treated by x rays during May, June, July, August, and September. A gradual decrease in some of the patient's symptoms took place under the x-ray treatment. Especially noticed was the clearing up of an area of dullness in the chest in the region underlying the breast, and the return of breathing sounds over that portion of the lung. The appearances of the surface in and around the scar changed very little during this period, but on the whole there was some increase in the cancerous appearance. Unfortunately, in July the patient suddenly developed a lump on the opposite side in the lower part of the left breast which grew with great rapidity during August and September, and at the time when I saw it first, early in October, formed a large solid tumour involving the whole of that organ.

The patient received a first injection on October 8th. Within forty-eight hours there was a violent reaction, rigor, temperature of 105°, diffuse red rash on trunk and limbs, accompanied by oedema. These symptoms disappeared rapidly, and the breast rapidly diminished in size. With the subsidence of the breast it was possible to define clearly a large hard mass in the lower portion of the breast. The injections were continued weekly until November 11th, when the mass was excised. The patient is recovering rapidly from the operation, and treatment was recommenced on November 24th. Dr. R. Andrews reports that the growth is a rapidly-growing spheroidal cell carcinoma, without much fibrous stroma, and there are no appearances microscopically which are different from those found in any rapidly growing cancer.

CASE VII.

In the other case x rays were begun and continued for about the same period. The case was one of recurrence after operation for removal of the breast. Three or four small nodules could be felt in the subcutaneous tissue around the healed scar. These nodules underwent retrogressive changes, so that they could hardly be felt, but never disappeared completely. In August a small nodule of the same character was discovered on the border of the latissimus dorsi muscle in the posterior fold of the axilla, and in September it seemed as if the old nodules were again disposed to enlarge, in spite of a continuation of the x rays.

Accordingly, after a consultation, it was decided to try the injections, and on October 29th the first injection was given, and injections have been given since at weekly intervals. All the nodules have diminished in size, and the oedema of the arm, which had persisted since the last operation, has markedly diminished. As in the former case, forty-eight hours after the first injection, there was a definite reaction, a rigor, and rise of temperature.

Only these two cases have given such definite reaction, so it appears that my views expressed at Swansea of combining the two methods of treatment may ultimately work out successfully.

It is disappointing, of course, that microscopic evidence was not obtainable from the growth in the first of these two cases which would shed light upon the diminution in size of breast; but it is the fact that no injection was delivered

between the cancer and the healthy breast tissue, at the place, in fact, which has been found to be most desirable. The operation was made possible by the use of the drug, and it was thought undesirable to allow the patient the distress arising from the weight of the growth. At the time at which this paper is written it appears probable that the patient will benefit notwithstanding the unfavourable microscopic evidence.

The second case, so far, appears to be more favourable, owing to the rapid diminution in the size of the nodule, and a further report will be published later.

CONCLUSIONS.

To sum up: The condition which the treatment is designed to produce is, first, a leucocytosis; and, secondly, a fibrosis in the tissue affected by cancer. In the case of pulmonary tuberculosis there is no difficulty in producing these conditions; in that of cancer much greater difficulty is experienced in advanced cases than in the case of tuberculosis. However, it is claimed that the treatment is soundly based, and that although it is quite likely that the best possible means of initiating the changes desired has not yet been found, it is only a matter of time for improvement in the details of treatment to be effected.

In connexion with this statement it must be remembered that cancer is a very wide term, embracing a very large number of pathological growths; that it is not always possible to obtain specimens to satisfy the lust of pathology; that a clinician like myself has for his first object the removal of the morbid condition; his second—if he fails in his first—the alleviation of suffering.

The solution of the whole problem requires time and many workers. At Birmingham my great master, the late Dr. Matthews Duncan, speaking upon the subject of puerperal fever, said: "The ideas suggesting the researches of Pasteur, of Toussaint, of Greenfield, and Buchner may prove to be mere *ignes fatui*, but they may prove, on the contrary, to be true guides. It is by following out such ideas, verifying or disproving them by new investigations, that progress is made in science."

I intend to proceed in the course which I have adopted, and that is, to report from time to time the different clues which I obtain, and I must leave it to the rest of my profession either to follow Dr. Matthews Duncan's line with regard to my work, or to leave the matter alone.

It may be objected that I have not published the name of the second substance with which I have worked; this I shall do at the earliest possible moment, but at present the work is scarcely sufficiently forward for me to justify a preference for it over the cinamate of sodium. Dr. Morgan and I intend to leave no stone unturned which would prevent the placing at the command of the profession the best possible substance.

Finally, I desire to point out that the process of repair in tissues affected by cancer requires from the vital powers of human cells a very great expenditure of energy, and that there is therefore a loss of energy in the effort to repair. Success, therefore, in attempting to treat patients stricken with the disease with good results must depend to a great extent upon the physical condition of the patient treated, and, to some extent, upon the portion of the body attacked. The expectation of any successful specific form of treatment will probably prove a vain one—that of one based upon any lines such as those which I have above set out has, I venture to believe, been found, and no doubt improved ones will follow.

REFERENCE.

¹ *Lancet*, November 6th, 1880.

"PARAFFIN CANCER."

By ROBERT KIRK, M.D. EDIN.,
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To medical men practising in the mineral oil district, the prevalence of epithelioma among the workmen has been for many years a well-recognized fact, and the most cursory examination of the cases has shown that while the shale miners and reft men are generally exempt, the great majority of cases is found among the men employed in refining the solid paraffin. Cases, although not yet uncommon, are not nearly so numerous nowadays as they were some thirty years ago, and this, I think, is accounted for by the different process now used to purify the shale. This is now effected by superheated steam, while in the early days of the industry the

method of refining was shortly as follows: The crude paraffin was melted and mixed with naphtha, thoroughly agitated, and then run over a revolving drum containing a freezing mixture, which solidified it. It was scraped off the drum by a stationary knife, and the solid mass was then placed in bags and subjected to hydraulic pressure, by which the naphtha with impurities was got rid of. This process was repeated three times, and the naphtha used for the first washing was redistilled, fresh naphtha being always used for the third.

The workmen employed wore leather aprons and generally also leggings, and worked with their arms bare to the elbows, and from the nature of their work the hands and fore-arms were constantly in contact with the naphtha mixture, and as a consequence cases of eczema of a most intractable nature were very common. A continuation of the irritant generally caused deep inflammation of the hair follicles with small indurations which went on to what were generally known among the workmen as "paraffin plukes," and which were really small boils. These took a long time to heal, and left considerable hardening of the skin behind them, the cicatrices being generally pigmented of a dark brown colour.

Instead of healing, however, a considerable proportion of these boils after the slough had separated took on an ulcerative action, the centre breaking down and the edges remaining hard and ragged. These ulcers were very indolent, but were not accompanied by any affection of the glands, and when they cicatrized the cicatrix was without pigment, a smooth white patch on an otherwise pigmented arm. The great majority of these ulcers were simple non-malignant, but a considerable proportion took on malignant characters, the centre covered by unhealthy sanious discharge, the edges very hard, with considerable infiltration of the surrounding skin, and exhibiting all the characters, both macroscopic and microscopic, of epithelioma.

Early excision gave always satisfactory results; indeed, I have never seen recurrence of the growth in the scar when the incision included healthy skin all round, and as a result a fatal issue from the disease was extremely rare. Sometimes, although rarely, the gland on the inner aspect of the elbow became infiltrated and removal of it was necessary, but as a general rule the glands were not infiltrated.

The forearms were generally the site of the disease, but one case came under my notice eighteen years ago which was quite analogous to chimney sweeper's cancer. The patient, a man 30 years of age, would not wear the leather apron and in consequence his trousers got soaked with the paraffin mixture. He had eczema of the scrotum, with boils over the anterior surfaces of the thighs, but having heard so much about them from his fellow workmen paid little heed to them. He sought no advice but persevered at his work until at last he could not walk without very great pain. Then I saw him, and found him in an utterly hopeless condition with the right side of the scrotum, the root of the penis, the abdominal wall and inguinal region all involved in an epitheliomatous mass. Operation was out of the question and the poor fellow died some two months afterwards.

At present I have under observation a man whose history is shortly as follows. He is 71 years of age, healthy looking, well-nourished, working nine or ten hours a day. He entered the paraffin refinery thirty-four years ago, and suffered both from eczema and boils. Twelve years ago one of these boils broke down, ulcerated, and became epitheliomatous, and troubled him for nearly a year, when I excised it, the tumour being $1\frac{1}{4}$ in. in diameter, situated on the right forearm $4\frac{1}{2}$ in. below the olecranon to the ulnar side. To-day the scar is perfectly healthy. Eighteen months ago he consulted me about another ulcerating tumour on the right forearm near the head of the radius. Mr. Caird removed this in the Edinburgh Royal Infirmary. There has been no recurrence in the scar, but last July he again consulted me about another tumour within an inch of the scar; that was also removed, and at present there is no evidence of any further lesions. These tumours were all epitheliomata, and the conclusion that one must come to is that long-continued irritation certainly does predispose to the production of malignant disease.

BEQUESTS TO HOSPITAL.—The executors under the will of the late Mr. Robert Munn, of Burnley, have paid over to the Victoria Hospital for Burnley and district his residuary estate of £8,000, of which £4,000 is to form part of the endowment fund of the hospital, and the remainder to be for its general purposes.