The Bradshaw Lecture

ON

THE TREATMENT OF CANCER.

Delivered before the Royal College of Surgeons of England on December 1st, 1904.

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[MR. MAYO ROBSON began by considering the etiology of cancer, and expressed the opinion that while cancer is not infectious in the ordinary sense of the term, there is a large accumulation of facts to prove that it is locally infectious and capable of distribution by contact and inoculation. It was also undoubtedly auto-infective, so that an imperfect operation was dangerous, since by distributing the cancer cells it might implant numerous foci of disease. If possible cancerous tumours should be removed without preliminary incision, leaving a wide area of healthy tissue around the growth, and wherever practicable the nearest lymphatic glands, and the vessels going to them, should be removed, whether enlarged or not. If the glands were already infected it was of the utmost importance to take them away cleanly without rupture, and, wherever possible, in the same piece with the tumour. If the tumour was incised for diagnostic purposes the exploratory incision should be closed by sutures, the skin purified, the knife and needles boiled, and the surgeon's hands sterilized before proceeding with the operation. If, unfortunately, the wound has become soiled, it should be irrigated with a large quantity of saline solution, or of some antiseptic lotion, so as to wash away any loose masses of cancer cells or infected material which, if left, would probably become engrafted, and grow. Facts were quoted in support of the view that cancer is both contagious and inoculable among human beings, as it undoubtedly is among the lower animals. Though it might not be necessary to advise segregation of cancer patients, it would seem most desirable that all dressings taken from cancer patients should be burnt, that linen soiled by cancerous sores should be destroyed or disinfected by boiling, that contact with cancerous ulcers, whether of the lip, tongue, breast, uterus, or other parts should be avoided, and that common use of beds and utensils with cancerous patients should not occur. The lecturer then said:]

PREVENTIVE TREATMENT.

Until the true and ultimate causative factor in the life-history of the cancer cell is discovered, a preventive treatment generally applicable is unlikely to be arrived at; but it seems likely that, whether the cellular theory or the parasitic theory be the correct one, the biological problem of altering the life-cycle of the cells in the former case, or of forming an antiserum in the latter, will be surmounted.

Hitherto, however, no serum has been found that in any way limits or benefits the disease, and my experience coincides with that of other observers as to the worthlessness of the serum treatment now being employed and advocated by certain so-called cancer specialists.

PREVENTIVE OPERATIONS.

Pre-cancerous Conditions.

The so-called pre-cancerous stage of malignant disease may be due to disturbances of nutrition, to previous injury, to congenital defect, or to other departures from the normal conditions.

Senility and decadence of tissues which have passed the period of their usefulness and are about to undergo physiological rest are predisposing factors. Predisposing conditions also exist in certain parts of the body where embryological vestiges or rests are found, and in certain regions, as the pylorus and the caecum, and at the lines of junction of skin and mucous membrane.

In certain situations pre-cancerous conditions can be readily recognized, especially in the tongue, lips, larynx, uterus, and the skin, suggesting strongly that cancer is a new implantation on a prepared ground. Probably, if we could only find it, every cancer, whether external or internal, follows on a pre-cancerous condition. The liability of benign tumours, especially on epithelial surfaces, to undergo malignant changes is well recognized, hence the removal of such is generally advisable.

A general acceptance of the view that cancer has usually a pre-cancerous stage, and that this stage is one in which operation ought to be performed, would be the means of saving many useful lives, for it would lead to the removal of all suspicious epithelial conditions before the onset of cancer. I hold that the arrest or removal of known causes as well as the abolition of discoverable pre-cancerous conditions, whenever or however occurring, constitute true preventive treatment.

Cancer of the mouth, and especially of the tongue and lips, occurs very much more frequently in man than in woman, the increased frequency in the male sex being probably due in a great measure to the abuse of tobacco—a well-known source of irritation if used in excess, and which should be stopped as soon as it begins to irritate.

In any chronic ulcers—syphilitic, tuberculous, or dental—of the mouth or tongue, if not yielding to treatment, a free removal of the ulcer in the pre-cancerous condition is decidedly a wise precaution, as it is by a prompt removal of suspicious ulcers or papillomatous masses of the lips, tongue, or cheek that cancer will be prevented.

Scrotal epithelioma, or chimney-sweeper's cancer, is becoming a disease of the past, as the cause—irritation of the scrotum by soot—has been removed since the use of the long brush for sweeping and the need no longer for the sweep to ascend the chimney. Here legislation has determined the prevention of the disease.

Penile Cancer.—While the prevention of chimney-sweeper's cancer has been the result of a legislative act, the prevention of penile cancer among Jews is the result of a religious rite, for phimosis is the chief predisposing cause of cancer of the penis, and if circumcision were carried out among the Gentile population it would doubtless have the same beneficial effect.

Pre-cancerous Skin Condition.

Nearly all cases of skin cancer occur on exposed parts of the body, face, hands, genitals, or nipples, and on surfaces where there has been some lesion, such as warts, eczema, sebaceous tumours, ulcers, scars, etc.

Where such tumours or spots are in a position that renders them liable to irritation they should be excised, but whatever their situation, if they begin to enlarge, it is certainly wise to remove them before the onset of malignant disease to which they are so prone.

Pre-cancerous Conditions in the Gall Bladder and Liver.

[The lecturer said that facts recorded by himself, and by Zenker, Courvoisier, Schroeder, Beadles, and Rolleston established an undoubted relationship between cholelithiasis and cancer of the gall bladder and ducts.]

As gall stones produce characteristic symptoms and are therefore as a rule diagnosed early, and as they can be removed before serious complications have supervened with extremely little risk (in my experience extending over some hundreds of operations, less than 1 per cent.), the preventive treatment for cancer of the gall bladder is obviously removal of the source of irritation.

So impressed am I with the importance of this view, that although I know the symptoms of gall stones, which frequently depend on the associated catarrh, can often be relieved for a time by general treatment (though the gall stones producing the catarrh cannot be removed by medicine), yet I consider it wise to recommend their early removal, not only because it can safely be done, but also because the symptoms are likely to recur and lead to other complications, and not least important because in a considerable percentage of such cases malignant disease will supervene if the irritation be not removed.

Pre-cancerous Conditions in the Mammary Glands.

In the breast there are certain well known pre-cancerous conditions, such as eczema of the nipple (first described by Sir James Paget as a precursor of duct cancer), chronic inflammatory enlargements (the chronic cirrhotic mastitis of Billroth, the interstitial mastitis of English pathologists), cysts and adenomata, and last, but not least, induration following on injury. Many of these conditions will, if properly and seriously attended to, yield to treatment. Patients have usually themselves to blame for ignoring what they seem to think are trifling ailments, though sometimes the medical attendant may, to avoid frightening his client, make light of the condition. I would say far better to alarm and cure than to lull into a false sense of security, and have to counsel operation later when the conditions are less favourable for radical treatment.

If eczema of the nipple does not speedily yield to treatment, the nipple should be freely excised, and with it the first portion of the primary ducts. If a chronic inflammatory swelling does not disappear under adequate treatment, the lobule or lobules involved ought to be removed, or, if general, the breast should be ablated. Cysts or tumours, even if simple, should be taken away, and if, on examination after removal, there is any suspicion that the simple stage is passed, the whole breast should be removed, and with it the nearest lymph glands.

It ought to be recognized that the watching of a doubtful tumour of the mammary gland, until it becomes definitely malignant, is an unjustifiable and a blameworthy procedure. Removal in this stage can be done without risk, and while the anxiety of the patient is relieved the fear of the development of malignancy is removed.

Pre-cancerous Conditions of the Stomach.

Pre-cancerous conditions of the stomach are, in certain cases, distinctly recognizable, and, if diagnosed and treated, might save many patients from carcinoma. As the stomach is one of the commonest sites of cancer, if even a percentage of cases can be saved from malignant disease by timely treatment a great advantage will have been gained.

[After referring to the writings of Cruveilhier (1839), Rokitansky (1840), Dittrich (1848), Brinton (1856), Lebert (1878), Zenker and Hauser (1882), Rosenheim (1889), Hayem (1901), and Fuetterer (1902), the lecturer continued:]

In 1903 Audistere recorded examples, and made very careful examination of four personal cases. His conclusions are summed up in the following manner:

1. Simple ulcer of the stomach may be the starting point of a cancerous growth, a condition of things which appears to be not infrequent.
2. This malignant degeneration affects, as a rule, the chronic ulcers, especially in the pre-pyloric region. The change begins in the mucous membrane at the margin of the ulcer.
3. The transformed ulcer presents for a long time almost the same symptoms as a simple ulcer; the differential diagnosis is, therefore, very difficult.
4. Nevertheless, the diagnosis can be made by noting the persistence of the symptom, the resistance to treatment, the wasting, and the progressive anaemia. The pain, as a rule, is more severe than in cases of simple ulcer.
5. In cases of cancer apparently primary, the origin in an ulcer may be suspected if the pain is unusually severe and paroxysmal, if hyperchlorhydria is pronounced, or if haematemesis or perforation occur. The prognosis is decidedly more grave, for the progress of cancer grafted upon an ulcer is more rapid, and bleeding or perforation is liable to occur.

If these conclusions are correct—and my experience tells me they are—then it is quite clear that we must in all cases in which an ulcer of the stomach resists treatment or its scar narrows the pylorus, recommend an early gastro-enterostomy or excision of the ulcer in order to prevent the development of carcinoma. If a gastro-enterostomy be performed, the mechanical irritation of the ulcer in the pyloric region by food is reduced and the friction necessary to produce a carcinoma will probably not occur.

The estimates of the frequency of this malignant implantation upon chronic ulcer vary greatly. The number of carcinomata beginning in chronic ulcer is reckoned at 3 per cent. by Haberlin, Fenwick, Plange, and Berthold, 4 per cent. by Wollman, 6 per cent. by Rosenheim and Hauser, 9 per cent. by Lebert, and 14 per cent. by Sonicksen. Zenker believes that all, or almost all, carcinomata are secondary to ulcer. In no less than 38 out of 64 cases (59.3 per cent.) of cancer of the stomach on which I have performed gastro-enterostomy for the relief of symptoms, the disease having advanced too far for gastrectomy, the long history of painful dyspepsia suggested the possibility of ulcer preceding the onset of malignant disease.

Carcinoma occurs most frequently in those areas in which the ulcers chiefly lie. Whatever the frequency of the malignant change in chronic ulcer may prove to be, the fact of its occurrence should be an additional incentive to the earlier surgical treatment of ulcers which prove rebellious.

I firmly believe that greater regard for oral asepsis, and more careful attention to the teeth would save much stomach disease, and I think one of the chief causes of the frequency of gastric ulcers among the mill operatives of Yorkshire and Lancashire is carious teeth with its accompaniment, oral sepsis. I am also firmly convinced that the early and thorough medical treatment of gastric ulcers and the surgical treatment either by gastro-enterostomy or excision of those

that prove rebellious, would do much to lessen the amount of cancer of the stomach.

Pre-cancerous Conditions in the Pelvic Organs of Women.

Cancer is perhaps more commonly noticed to supervene on a recognizable pre-cancerous condition in the uterus than is observable in any other organ, and the frequency with which cancer develops in multiparae, and especially in those who have had lacerated cervix, points distinctly to cause and effect.

The frequent advent of cancer on old scars is well known in various parts of the body, especially in those placed where their nutrition is liable to disturbance, as in the scars of burns. Now in the cervix uteri we see the scars of old ulcers, the result of laceration in childbirth, often remaining untreated for years and leading to constant distress, with backache, leucorrhoea, and other well-known symptoms. Only a few months ago, I saw a case of this kind pass from the simple to the malignant stage; an operation having been declined on both occasions when I saw the patient, and only consented to six months later, after epithelioma had developed. Cancer of the cervix uteri is infrequent in sterile women whose cervical canal has not been subjected to the lacerations which often occur in parturition, whereas cancer of the body of the uterus is of equal frequency in those who have and have not borne children. Most careful attention to post-puerperal conditions and the performance of the simple operation described by Emmett would remove this source of danger in a great number of cases.

Uterine adenomata doubtless predispose to cancer of the uterus, and the co-existence of mucous polypi and epithelioma is not without its significance, as early operation in such cases would probably prevent the onset of malignant disease. The malignant degeneration of uterine myomata is probably commoner than is generally supposed, and on several occasions I have removed what was supposed to be a simple myoma of the uterus, and found a sarcomatous change going on. As myoma of the uterus can be removed by hysterectomy with very small risk, I make it a rule, whenever a myoma begins to enlarge at or near or after the menopause, to advise its removal; while I hold with those writers who recommend the removal of "fibroids" whenever the symptoms of haemorrhage, pressure, or pain seriously interfere with health or comfort. Surely, it is better to accept a risk of 2 to 3 per cent., with a view to the removal of a disease that in itself promises to endanger life, and which in a certain percentage of cases undergoes a malignant change, than to have to operate when cancer or sarcoma have already developed, and when the risk of operation will be seriously increased and the chances of permanent cure very much lessened.

The fact that malignant disease of the ovary begins in the first place as a small tumour (often cystic), and that cystic disease is apt to undergo malignant degeneration, affords good ground for recommending operation at an early stage in the case of any ovarian tumour, when perchance the disease may be caught in a pre-cancerous condition; or should malignant disease have already commenced it will be limited and removable.

Dermoids may undoubtedly undergo malignant transformation, and, knowing their structure, it is a wonder that this does not occur more frequently.

Papilloma of the ovary naturally tends to malignancy, though at first it is simple, and when removed thoroughly does not recur. Even if in these cases the peritoneal surface has already become warty (owing to rupture of the cysts) and ascites has developed, the removal of the growth has in my experience in a number of cases led to recovery; for with the removal of the original tumour the peritoneal warts have shrivelled and the ascites has disappeared.

Seeing that ovarian tumours have frequently long pedicles, and that early removal means a very complete and perfect operation, almost devoid of risk, it is surely better to remove them as soon as the diagnosis is made, thus saving the patient the sufferings incident to a growing abdominal tumour and at the same time removing the dangers of the supervention of more serious malignant disease.

Pre-cancerous Conditions in the Intestines.

Though, on account of its inaccessibility to direct examination, a pre-cancerous condition is difficult to diagnose in the upper intestines generally, it will be found in many cases that there have been premonitory symptoms pointing to ulcer or colitis. Irregular pains, the passage of

mucus or blood, and constipation possibly alternating with diarrhoea, should rouse a suspicion of organic disease, and lead to a careful physical investigation that may reveal irregular peristalsis or possibly a tumour, which even if not caught in the pre-cancerous stage will be recognized, and treated in the incipient and curable stage of cancer.

Any disease high up in the rectum or in the lower loop of the sigmoid flexure is quite out of reach of the finger, and cannot be palpated through the abdominal wall unless of considerable size; here, as a rule, disease has had to be diagnosed by symptoms alone, and symptoms sufficiently definite to warrant exploration only come on when the disease has passed the most favourable time for radical treatment. Fortunately by means of the electric sigmoidoscope invented by Professor Strauss of Berlin, to which attention was drawn by Mr. P. L. Mummery, a clear view of every portion of the inside of the bowel may be obtained, even as high as the top of the sigmoid flexure, without inconvenience or danger to the patient. It will do away with the need for exploratory operations in this region for mere diagnostic purposes, and will enable disease to be more frequently removed in the pre-cancerous condition.

In the rectum the earlier treatment of hæmorrhoids and ulcers and of all chronic sources of irritation is obviously rational and advisable, and may sometimes be the means of preventing the onset of malignant disease.

RADICAL TREATMENT OF CANCER.

By the radical treatment of cancer I mean the entire removal of the disease at an early period, together with a wide margin of healthy tissue, and, if practicable, the nearest lymphatic glands.

In estimating what may be done for cancer by radical treatment I do not think it sufficient simply to consider the mortality of any special operation, as has so often been done, when operative success was used as a cloak to mask therapeutic failure, but I want to know the ultimate results, after the lapse of years, of operations undertaken at an early stage of the disease, where the cancer had been freely and widely excised. Nor do I think it fair to surgery to average the statistics of all surgeons, or even of all hospitals, but rather to select the statistics of operators interested in special lines of work who can show what can be done in their own particular region. The levelling process should, from my point of view, be a levelling-up to the best and not an averaging down to the worst.

Cancer of the Breast.

In my experience in hospital and in private practice I can point to a very large number of radical mammary operations, and I have been astonished to find how many, especially of the private cases, where, through the kindness of the family physicians, I have been able to trace the after-histories, have survived beyond the three years' limit, and how many are still living and well many years after operation. The following is a brief account of all the operations for cancer of the breast—62 in number—that I have done in private:

1	alive and well	12	years after operation.
1	"	10	"
1	"	9	"
2	"	8	"
1	"	7½	"
1	"	7	"
3	"	6½	"
1	"	6	"
2	"	4	"
1	"	3	"
3	"	2½	"
1	"	2	"
2	"	1½	"
1	lived 20 years, and died of chronic bronchitis.		
1	" 2 "		meningitis
1	" 2 "		phthisis
1	" 1 year "		enteric fever
1	" 6 months "		apoplexy
8	cannot be traced.		

Cases that Recurred.

1	lived 6 years.	and had recurrence of the disease.
2	" 5 "	"
2	" 4 "	"
1	" 3½ "	"
2	" 3 "	"
2	" 3½ "	"
5	" 2 "	"
9	" 1 "	"
4	" 6 months "	"
1	" 4 "	"

There was no operative mortality.

Thus, 23 survived the three years' limit.

Twenty are now alive and well at periods up to twelve years after operation. Others operated on within the year are not included in the statistics.

Five died from other diseases without recurrence of cancer, 1 twenty years after the major operation.

Twenty-eight had recurrence, though in 8 it was over three years subsequent to operation.

Eight could not be traced.

My early operations were not so thorough as those done in later years, otherwise I feel sure that the recurrences would have been fewer.

Following on Mr. Moore's work at the Middlesex Hospital came an important paper by my old friend and colleague, Sir William Banks, whose recent death we all sincerely lament. This paper, advocating early and free removal and the clearing out of the axilla in all cases, gave a great impetus to the radical treatment of mammary cancer. In 1880 Samuel W. Gross wrote: "The wiser course is to explore the axilla even if its glands cannot be detected from without"—a view which is now universal among surgeons.

In the Lettsomian Lectures for 1900 Mitchell Banks gave the results in 175 patients operated on for cancer of the breast: 108 had remained free from local recurrence; of the 108, 73 lived over three years as follows:

Cases that lived between 3 and 6 years after operation, 40; cases that lived between 7 and 14 years after operation, 28; cases that lived between 16 and 21 years after operation, 5.

To Dr. Halsted of Baltimore belongs the distinction of carrying operations for cancer of the breast to their widest limits, and when I had the opportunity of observing that eminent surgeon operating in the Johns Hopkins Hospital some years ago I felt that his thorough work ought to show positively whether extensive removal was to be the operation of the future. Dr. Halsted has been so kind as to furnish me with his completed statistics (prepared by Dr. Bloodgood), from 1889 to 1902, which will, I think, convince the greatest sceptic as to what may be done by thorough and complete work. The following is a brief account of the ultimate result of 161 patients admitted to the Clinic with operable primary tumours of the breast, on whom complete operations were performed between June, 1889, and August, 1899:

In August, 1902, 60 patients were living and cured, 7 had lived over 3 years and died from other causes, and 2 had died from other causes within the 3-year limit, autopsy showing no signs of recurrence. This gives 69 cases, or 42.8 per cent., positively cured. An analysis of the 161 patients shows that 83, or 51.5 per cent., survived the 3-year limit.

The operations performed consisted of complete excision of the breast, both pectoral muscles, and axillary contents in one piece, and complete excision of the contents of the supra-clavicular fossa. During thirteen years 305 patients with primary and 38 with secondary tumours were admitted to the clinic, and of these it is worth noting that 83, or 27.2 per cent., were inoperable, owing to delay in seeking surgical assistance. It is also of interest to note that in no case was local recurrence or internal metastasis observed after three years.

Mr. Bryant has recorded from his own experience 46 cases of amputation of the breast for cancer, in which the patients survived the primary operation from five to thirty-two years. My friend, Mr. Pridgin Teale, has told me of 17 instances in which his patients have survived from eight to twenty-six years. Mr. Sheild, in a paper read before the Royal Medical and Chirurgical Society in 1897, collected 44 cases from various sources where no recurrence took place after the primary operation, for periods varying from six to twenty years; some of Mr. Teale's cases, already referred to, were included in these. A case of my own had been operated on by Mr. Marrant Baker, and afterwards by Mr. Durham, and I performed several subsequent operations, the patient living for about twenty years after the first operation.

My colleague, Mr. Watson Cheyne, adopting a most thorough and radical operation on lines similar to those of Professor Halsted, shows very satisfactory results. He says that, taking the average of all cases operated on, favourable or otherwise, something like 50 per cent. will remain well for a number of years, and in these cases, in which the tumour is small and well limited, and the glandular infection is slight, the proportion of successes will be considerably greater. In these views I most thoroughly agree. Professor Rodman has said that, of 629 cases of cancer of the breast operated on by American surgeons, 44.16 per cent. survived the 3-year limit.

Cancer of the breast, if operated on early and with thoroughness, is by no means the incurable disease that many still think, in a very large percentage, 50 or more, the

patients may look for over three years' respite; and in 40 per cent. to a much longer period of freedom, and many to a genuine cure.

RADICAL TREATMENT OF CANCER OF THE STOMACH.

It was only in 1879 that Péan performed his first pylorotomy for cancer of the stomach, and in 1881 that Billroth did the first successful operation; before that time, and long after by many, the disease was held to be incurable. At first sight it would appear to be hopeless to expect that eradication of the disease could be possible in an organ situated as the stomach is and so freely supplied with blood vessels and lymphatics; yet a careful study of its anatomy shows it to be fixed only at the cardiac extremity, and with the exception of that part the remainder is as freely accessible for operative purposes as the intestines; moreover, the disease if caught early can be completely removed. I can point to a number of patients in good health on whom I performed partial removal of the stomach years ago, and to one especially.

A man, aged 42, from whom I removed the whole stomach, except a small portion of the dome and the cardiac orifice, four years ago. He was reported last month to be robust and well, to be able to take quite ordinary diet, and to have followed his business without any disability from within two months of his operation up to the present time.

In another case, a woman, aged 54, a partial gastrectomy was performed at the same time as removal of the gall bladder, both organs being involved in cancer. She remains well now in the fifth year after operation. In another case, a woman of 50 remains well nearly four years after the removal of the centre of a cancerous hourglass stomach, the proximal and distal healthy portions having been joined over a decalcified bone bobbin.

A number of other cases might be referred to in which the patients are apparently in perfect health after radical operations performed one to three years ago; but for a radical operation to be successfully performed it is necessary that there should be early diagnosis and immediate operation. It is useless to wait until a tumour develops or until coffee-ground vomit shows that ulceration has occurred. In that way valuable time is lost, glandular infection occurs, and the extension of the disease makes an operation more difficult to perform, and the patient is less able to bear it on account of anaemia and exhaustion. As the early symptoms are often equivocal and uncertain, we must be prepared to confirm the diagnosis by exploration, and then be prepared to go on and perform a radical operation. Medical treatment cannot cure, and can do very little even to prolong life; surgery offers the only chance of cure.

Whenever a patient at or after middle age complains somewhat suddenly of indefinite gastric uneasiness, pain, and vomiting, followed by progressive loss of weight and energy, and associated with anaemia, the possibility of cancer of the stomach should be recognized, and if no improvement takes place in a few weeks at most, an exploratory operation is more than justified. Our diagnosis can only be rendered certain by a digital examination, which may be effected through a small incision that can, if needful, be made under cocaine anaesthesia with little, if any, risk.

It may be discovered that the disease is manifestly non-malignant, and that some curative operation can be done, or that the disease resembles malignancy, both in its history and naked-eye appearance, and is yet, if we may judge from results, apparently not malignant, as in a number of patients treated by gastro-enterostomy that I have reported, who were at the time of operation extremely ill and supposed to be suffering from cancer of the stomach, but who, as the result of surgical treatment, are now in good health. Or it may be found that the disease is cancer in an early stage, and that a radical removal is possible.

Removal at an early stage offers good prospects of immediate recovery and a fair probability of cure, and excision of even a considerable portion of the stomach may be something more than a palliative operation. Although it is better to have cancer diagnosed and operated on early, yet we need not take the pessimistic view that if a tumour be manifest it is too late to perform a radical operation. Professor Kocher, of Berne, has been so kind as to give me the results of his gastrectomies for cancer up to the present. The following is the report as sent to me in a letter dated October 14th, 1904:

I have performed 97 resections of the stomach for cancer and sarcoma (one only for sarcoma). Of these, 52 cases (operated on between 1881 and 1898), 65.4 per cent., recovered, 34.6 per cent. died. From 1898 to August, 1904, 45 cases have been operated on, with 82.2 per cent. recoveries, and 17.7 per cent. deaths. Of these last 8 cases which died (that is, 17.7 per cent.), one died from perforation at the point of union, one from perforation of the transverse colon in consequence of local gangrene, and six cases from pneumonia, whilst locally everything went

on in a normal way. Without these cases, dying from complications existing for the most part before operation (bronchitis, etc.), we should have had only 5.1 per cent. of deaths directly from operation.

With regard to definite results, 51 of the whole series died later, living up to six years (in the mean 18.7 months), much longer than after gastro-enterostomy, and in much better condition.

Twenty cases are still living, 2 for several months only, 1 for ten months, 6 for one year, 1 for two years and two months, 1 for two years and eight months, 1 for three years and eight months, 3 for five to five and a half years, 1 for six years, 1 for seven years, 1 for eleven years, and 1 for sixteen and a quarter years.

All the patients, except one, of the 20 living are in very good health. Dr. Matti and I have seen most of these cases ourselves, and Dr. Matti has examined them carefully as to the functions of the stomach. The others have been examined by their local doctors. We may be sure that a good many of our cases have given a radical cure.

All of the cases living, except one, have been operated on by our method of resection with gastro-duodenostomy. This method, applied in 71 of the cases, has also given the best result as to immediate mortality—that is to say, 16.9 per cent. of deaths, and 83.1 per cent. of recoveries.

Drs. W. H. and C. Mayo¹ have performed 43 radical operations for malignant disease of the stomach with 7 deaths—that is 16.2 per cent.; all but 2 of those who recovered lived over a year, 1 lived three years and seven months, and several are well more than two years after operation. McDonald, quoted by Mayo, was able to collect 43 cases definitely cured by operation. Murphy collected 189 cases with 28 deaths, of which 17 survived over three years. Of the partial gastrectomies performed by myself and Mr. Moynihan before 1897 the mortality was 75 per cent., whereas since 1896 it has only been 12.5 per cent.

Removal of Cancer of the Tongue.

I remember as a student seeing a number of removals of the tongue by the éraseur, there being no question of removal of the glands or of the floor of the mouth. In nearly every case recurrence took place within a few months, and the operation was falling into disfavour, when Whitehead invented his operation of removing the tongue widely with scissors, and Kocher's operation of clearing out the tongue, floor of the mouth, and the submaxillary and lymphatic glands also came to be practised.

These operations brought a marked change, and it was soon found that a good percentage of patients operated on remained free from disease for some time, and others were really cured. I can point to a case well seven years after operation, to another five years, and to others over three years, and it is of interest to note that in these cases very good power of speech is retained by the patients.

My colleague, Mr. Butlin, putting together his own cases and those of Krönlein, Kocher, and Whitehead, found that 40 out of 199 remained free from disease or had died of some other cause than cancer more than three years after the last operation. Mr. Whitehead has excised the tongue independently of other complications on 50 occasions without a death, and in 116 operations the mortality was only 2.5 per cent. He refers to cases living thirteen, twelve, and eleven years after operation, and makes the statement that "provided the tongue and adjacent affected parts are removed thoroughly and early there exists a fair prospect of life being extended beyond the three-year limit." Mr. Stanley Boyd, out of 26 cases, reported 1 alive eleven years after operation, 1 eight and a quarter, 1 five, 1 four and three-quarters, 1 four and a quarter, 1 four years, and others in which life was prolonged for shorter periods; in over one-fourth of his cases life was prolonged beyond the three-year limit.

If only diseases of the tongue were attacked in the pre-cancerous stage; if only this were done more frequently, and if, even when cancer had developed, time were not lost in dosing patients with iodides week after week until the disease has extended too widely, there would be a much brighter tale to tell.

Cancer of the Larynx.

What could at first sight appear more hopeless for radical treatment than cancer of the larynx, which formerly used only to be treated palliatively by tracheotomy, later was removed by the formidable operation of complete laryngectomy with a very high mortality, and, lastly, has been most successfully dealt with, when seen early, by the much more simple operation of thyrotomy and removal of the diseased part, as advocated by Mr. H. T. Butlin in 1889. My friend, Sir Felix Semon, has been kind enough to give me the statistics of his thyrotomy operations, the results of which are remarkable, and which prove up to the hilt the special

point which I want to insist on in this lecture, that if we get cancer cases sent to us sufficiently early, operation is not merely palliative, but curative. Sir Felix Semon says:

I can now summarize my results to the effect that out of 18 cases of undoubted malignant disease of the larynx which I have operated upon by thyrotomy between June 2nd, 1891, and July 29th, 1902, 15, that is, 85 per cent. were permanently cured. Three of these patients died several years after the operation from affections altogether unconnected with the original disease; one, six years after the operation, from an acute abdominal affection; the second, three years and a quarter after the operation from embolism of the heart or lungs; the third, four years after the operation from pneumonia. The remaining 12 are now alive and well; whilst the vocal results, with the exception of a few cases in which it was necessary to remove both vocal cords, are surprisingly good.

My personal experience of the disease in this situation is necessarily small, but I venture to relate the case of a gentleman, aged 50, from whom I removed a cancer of the tongue five years ago, and a cancer of the vocal cord by thyrotomy, three years ago. He came to see me from Brazil this summer, and although he had only half a tongue, half an epiglottis, and one vocal cord, he could speak perfectly well. He said that his health was very good, and that he was able to carry on his professional work without any disability.

Mr. Marmaduke Sheild tells me that he has under observation four cases in which epithelioma of the vocal cord was freely removed in an early stage by thyrotomy, all in men over 40 years of age; of these one is well six years, one four years, one nearly four years, and one two years later. Professor Kocher has been kind enough to furnish me with the statistics of his cases that were evidently more extensive, and had to be treated by the more formidable operation of partial and complete laryngectomy; of these 8 are radically cured. He says:

The number of my excisions of the larynx for malignant growths is 30, of which 29 were for cancer, and 1 for sarcoma. The results are that 8 cases offer a radical cure, that is to say, 26.6 per cent. These include the 1 case of sarcoma. Of 6 cases of total excision, only 1 survived 2 years and died of pneumonia. Of 9 unilateral excisions (one half of the larynx), 2 died without return of the disease after 1½ years; 2 are living in perfect health, after 6 and 8 years respectively. Of 10 circumscribed excisions, 2 are still in good health after 6 and 6½ years respectively. Of 4 cases operated on by pharyngotomy subhyoidæ, 2 are quite well after 14 months and 10 years. Out of the cases where the carcinoma was still circumscribed and no lymphatic glands affected, one half of all cases have been definitely cured. All depends upon early diagnosis and early surgical aid.

Radical Operations for Cancer of the Intestine.

Intestinal cancer is nearly always columnar-celled carcinoma, and, as shown by Haussman,² even when it has advanced to a fatal issue, the disease is limited to the gut in over 40 per cent. of cases. I believe that all the cases in which the disease is limited ought to be capable of cure by enterectomy if operated on early. It should also be borne in mind that even if enlarged glands be present it does not necessarily mean that they are cancerous, for clinical and pathological experience has shown the contrary. In some of my own cases, enterectomy, despite the presence of enlarged glands, has resulted in cure. I have performed enterectomy on over forty occasions; of these 31 have been for growth, of which 6 died. As to the ultimate issue, it is almost impossible to trace the hospital cases, though two were heard of as being well four and a half and two years later. Among 21 operations for tumour done in private there were 17 recoveries; of these, 1 is alive and well ten years after excision of the sigmoid flexure, and has had two children since her operation. One is alive and well four and a half, 3 are well three and a-half, 2 three, and 1 one year after operation without sign of recurrence. Others lived—1 for three years, 3 for two years, and 5 for lesser periods, and died of recurrence.

In all chronic ailments associated with dyspepsia or constipation or abdominal pain, a careful examination of the abdomen should be made in order to discover disease at the earliest possible moment, for to wait until obstruction occurs is to lose the favourable moment, and to add very seriously to the danger of any operation.

In operating I make a very wide sweep of the disease, going several inches beyond the growth above and below, and removing the lymphatics and glands belonging to the affected parts of the bowel as far as possible. Personally, I prefer to use my decalcified bone bobbin, but I have employed with success the simple suture and the Murphy button, though I still feel that by means of the bobbin used as a temporary

splint around which to apply sutures, I can perform a safer operation than by any other method.

The operations performed before the perfection of the technique of intestinal surgery, massed together, and said to furnish an average mortality of from 30 to 40 per cent., ought not to be taken as an example of what can be done to-day; for instance, Mr. Bilton Pollard published in the *BRITISH MEDICAL JOURNAL* for January, 1904, reports of 7 colectomies without a death, and of these

- 1 has lived 5 years after operation.
- 1 is living and well three and a half years after.
- 2 are well one year after.
- 1 recurred one year and nine months after.
- 1 recurred one and a half years after.
- 1 recurred one year after.

Professor C. E. Morton, employing the decalcified bone bobbin, has performed 7 consecutive cases of colectomy without a death; and my friend Mr. H. Littlewood has reported³ 14 colectomies with 10 recoveries, several of the patients being well three or more years later. Von Mikulicz has written:

In my experience the present results after operations for malignant tumours of the large intestine are very favourable, more so than generally supposed. I think we should point out this fact to physicians who are still very sceptical about this operation.

The conjoint statistics of Mikulicz and Korte show that of 24 cases, 9 were under observation for four years after operation and some much longer, one seventeen years without recurrence.

Cancer of the Rectum.

This is an affection that of all others lends itself to a radical cure, for it can be recognized early. It is safe to say now that there is no part of the alimentary canal that cannot be reached for a radical operation, for even in the rectum that part which cannot be reached from the perineum can be got at from above by opening the abdomen with the patient in the Trendelenburg position, as was so ably demonstrated by my friend, Sir Charles Ball, from this chair last year; and, fortunately, there need be no doubt about the nature and extent of the disease in this region, for the electric proctoscope enables the lower bowel to be examined by the eye without difficulty to a height of 30 centimetres.

Among other notable examples of radical cure, I can point to one patient living in perfect health and with good control of the bowel, from whom I removed a cancer of the rectum by proctectomy twelve years ago; to another, eight years; and to others who are well and enjoying life several years after operation. My colleague, Mr. Clinton Dent, has recently recorded the case of a patient who died from recurrence in the liver twenty-one years after removal of a cancer of the rectum.

Mr. Harrison Cripps has recorded 38 perineal proctectomies, with 3 deaths—a mortality of 7.8 per cent. Of these 2 were well one to three years, and 7 more than three years after operation. In no case did recurrence take place after three years. Mr. Percy Furnivall has tabulated Duplay's and Reclus's collected cases as follows:

Lived 13, 14, 16, and 16½ years after operation, 4.	
" 11	" 3.
" 8	" 3.
" 7	" 4.
" 6	" 6.
" 5	" 13.
" 4	" 19.
" 3	" 15.

My colleague, Mr. Watson Cheyne, says:⁴

I should reckon the mortality of excision of the rectum at from 5 to 10 per cent., as the result of recent improvements in the operation. It is a very valuable procedure in suitable cases, and the risk run by the patient is not at all excessive, seeing the advantages that may be gained.

Cancer of the Gall Bladder and Liver.

If the favourable pre-cancerous period has passed, and malignant disease has actually supervened, can anything be done for the sufferers?

At first sight it would appear that cancer of the gall bladder is an utterly hopeless disease, especially when it has extended to the liver. I have, however, operated on 12 cases of cancer of the gall bladder, and in 11 the disease extended to the liver, forming a tumour of some size. Of these 12 cases 10 recovered from the operation and lived for varying periods. Five of these patients are at the present time alive and in good health at periods of 5½, 5, 4½, 4, and 1½ years respectively subsequent to operation. These were cases of primary cancer of the gall bladder due to the irritation of gall stones, and the liver growth was due to extension by continuity, not to

secondary deposits in that organ. In one case I was able to remove as much as half a pound of the liver with success.

Cancer of the Lip.

Even if the pre-cancerous stage has passed, a free removal of the disease at an early stage and while it is still local enables a very good prognosis to be given.

Mr. Butlin's analysis of 114 cases of epithelioma of the lip from the Gottingen clinic showed that 53 per cent. of cases were alive and well or had died of other diseases more than three years after removal, and of these twelve had lived for at least twelve years and one for eighteen years after operation.

Dr. Lo's analysis of the returns of the Tübingen Hospital for 1843 to 1885 and found that the cures averaged 51 per cent., but in the years from 1885 to 1898 they had increased to 66 per cent.

Mr. Marmaduke Sheild has told me of one patient from whom he removed an epithelioma of the lip with submental glands twenty years ago. The patient died last year at the age of 81, without recurrence.

Cancer of the Penis.

In epithelioma of the penis amputation yields a cure in one-third of the cases operated on.

Mr. Butlin gives cases under his own observation living and well from six to ten years later, and of some collected cases well for nearly twenty years.

Mr. Sheild has told me of 4 cases of his well after nine, seven, six and a half, and three years respectively, and I can point to one case well after fifteen years and to others at lesser periods.

Cancer of the Uterus.

Much may be done to prevent this dread disease by careful surgical treatment, and that without risk. Even when the pre-cancerous stage is passed, if women could be educated to the fact that were they to seek advice earlier, and, in fact, whenever an abnormal sanguineous discharge appears, apart from a menstrual period, in a very large percentage of cases the cancer would be recognized in its incipient condition when the disease is local, and removal could be carried out and cure effected.

In order to prove these statements I wrote to the medical attendants of all the private patients on whom I had operated, and was very much gratified to find many not only living but in robust health, from whom I had removed cancer of the uterus by complete or partial hysterectomy years ago. I made an attempt to get the statistics of my hospital patients, but found it absolutely impracticable, as nearly all the letters were returned on account of change of address, so that the statistics are limited to private patients; and as these cases were nearly all seen at an early stage of the disease, and the growth was examined microscopically after removal, I think they form a valuable addition to the statistics of uterine cancer, for every case can be verified.

They are 27 in number—12 total hysterectomies without a death, of which

1 is alive and well 8½ years after operation.

1 " " 7 " " "

1 " " 6 " " "

2 are " 5 " " "

2 are " 3 " " "

1 is " 1½ " " "

From 4 no answers were received.

14 very free supravaginal amputations of the cervix without a death, of which

1 is alive and well 11½ years after operation.

1 " " 10½ " " "

1 " " 10 " " "

1 " " 9 " " "

1 " " 6 " " "

1 lived for 5 years and died of heart disease without recurrence of cancer.

From 2 no answer was received.

1 lived 4 years, and recurrence took place.

5 lived 1 year or less, and recurrence took place.

Mr. Jessett has been so good as to furnish me with his statistics.

He has performed hysterectomy 180 times with 10 deaths, but of the last 73 cases only 1 died. Of the first series of 107 cases, very many being hospital cases were lost sight of, but 5 are living and well, 11, 10, 9, 9, and 8 years respectively. Of the last series of 73 cases, 12 are known to be well from 2 to 5 years after operation.

Professor Olshausen's experience in vaginal hysterectomy extends to 303 cases; up to 1903 he had performed 671 operations, with a mortality of 6 per cent.; since 1903 he had done 137 operations, with a mortality of 4.4 per cent. As to the ultimate issue, 70 per cent. lived for 2 years without recurrence and 38 per cent. had had no recurrence after 5 years. The extensive operation involving the removal of the pelvic glands results in a high mortality, and it has not yet been shown that a greater number of cases have been radically cured than by the vaginal opera-

tion. When once the glands have become infected a radical operation, Olshausen thinks, is impracticable.

Professor Wertheimer, who performs an extensive operation; only operates on a small proportion of the patients he sees, and his ultimate results are consequently very good—9 out of 14 patients free from disease at the end of 4 years.

Professor Zweifel, of Leipzig, of 153 operations for uterine cancer since January 1st, 1897, had 35.6 per cent. of the cases well and free from recurrence after 5 years.

These facts prove beyond a doubt that cancer of the uterus is a curable disease if diagnosed and removed in its earlier stages. It seems to be most desirable that some crusade against the neglect of the well-known early symptoms of uterine cancer should be undertaken, and that women should be warned how important it is for them to consult their medical attendants at an early stage, when, in case of doubt, a small piece of tissue can easily be removed and examined microscopically.

PALLIATIVE OPERATIONS.

[Mr. Mayo Robson then spoke of the value of palliative operations, especially in cancer of the stomach and intestines, not only to prolong life, but to prolong it in greater comfort, and in concluding his lecture he said:]

My purpose will have been served if I have been able, in however small a degree, to convince those who have the chance of seeing patients in the early stages of their illness, that in many cases cancer can be prevented by treatment in the pre-cancerous stage; that even when cancer has developed, if it be seen early and thoroughly removed it is frequently a curable disease; and lastly, that even in the later stages much may be done by surgical treatment to give real relief.

Is it too much to hope that some of the views I have enunciated may filter through the profession to the public, and serve to convince them that until a true prophylactic for cancer is discovered, they will be consulting their own interests best by seeking medical advice earlier, since to trifle with their ailments in the early stages is to lose the favourable moment and ultimately to hear the verdict—alas, too often pronounced—too late!

REFERENCES.

¹ Medical News, April 16th, 1904. ² Thèse de Paris, 1882. ³ Lancet, May 20th, 1903. ⁴ BRITISH MEDICAL JOURNAL, June 13th, 1903, p. 1362.

The Horace Dobell Lecture

ON THE

LIFE-HISTORY OF SAPROPHYTIC AND PARASITIC BACTERIA AND THEIR MUTUAL RELATION.

Delivered before the Royal College of Physicians of London on
November 22nd, 1904.

By E. KLEIN, M.D., F.R.S.,

Lecturer on Advanced Bacteriology at St. Bartholomew's Hospital.

[ABSTRACT.]

[AFTER acknowledging the honour conferred on him by his selection to deliver the first Horace Dobell Lecture, Dr. KLEIN said:]

The subject I have to deal with will best be considered under the following three heads: (1) Morphological; (2) Chemical; (3) Physiological.

MORPHOLOGICAL.

What are bacteria? Since v. Naegeli's—and particularly F. Cohn's—fundamental researches into the morphology and development of bacteria, these micro-organisms are considered as a special order amongst fungi, being spherical, oval, or cylindrical cells without a nucleus, enclosed in a sheath, devoid of chlorophyll, and multiplying by first enlarging and then dividing by simple fission, hence their name "schizomycetes." Amongst the bacterial species some have been shown in which the individual cells are capable of concluding their life cycle by forming in their interior spores of a permanent character, which spores, after the total disappearance of the remainder of the cell, become free, and are capable of preserving for long periods their germinating power, and consequently of starting new generations, notwithstanding various inimical influences of locality, temperature, etc., surrounding them.

A considerable number of observations have, however, been