

**The Morton lecture on cancer and cancerous diseases : delivered at the Royal College of Surgeons of England on Thursday, Nov. 29, 1888 / by Sir Spencer Wells.**

**Contributors**

Wells, Spencer, 1818-1897.  
Royal College of Surgeons of England

**Publication/Creation**

London : J. & A. Churchill, 1889.

**Persistent URL**

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The Morton Lecture

ON

CANCER AND CANCEROUS DISEASES

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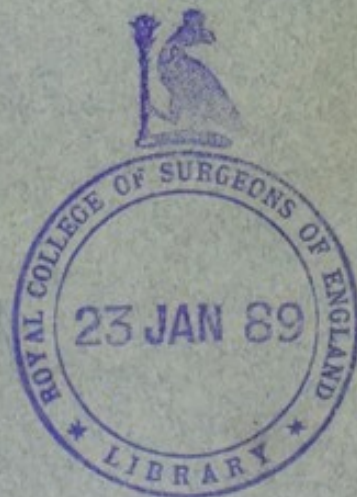
ROYAL COLLEGE OF SURGEONS OF ENGLAND

on Thursday, November 29, 1888

BY

SIR SPENCER WELLS, BART., F.R.C.S.

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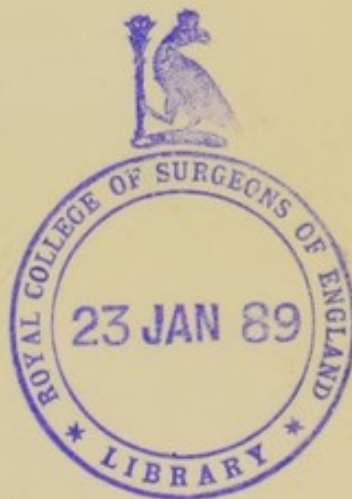
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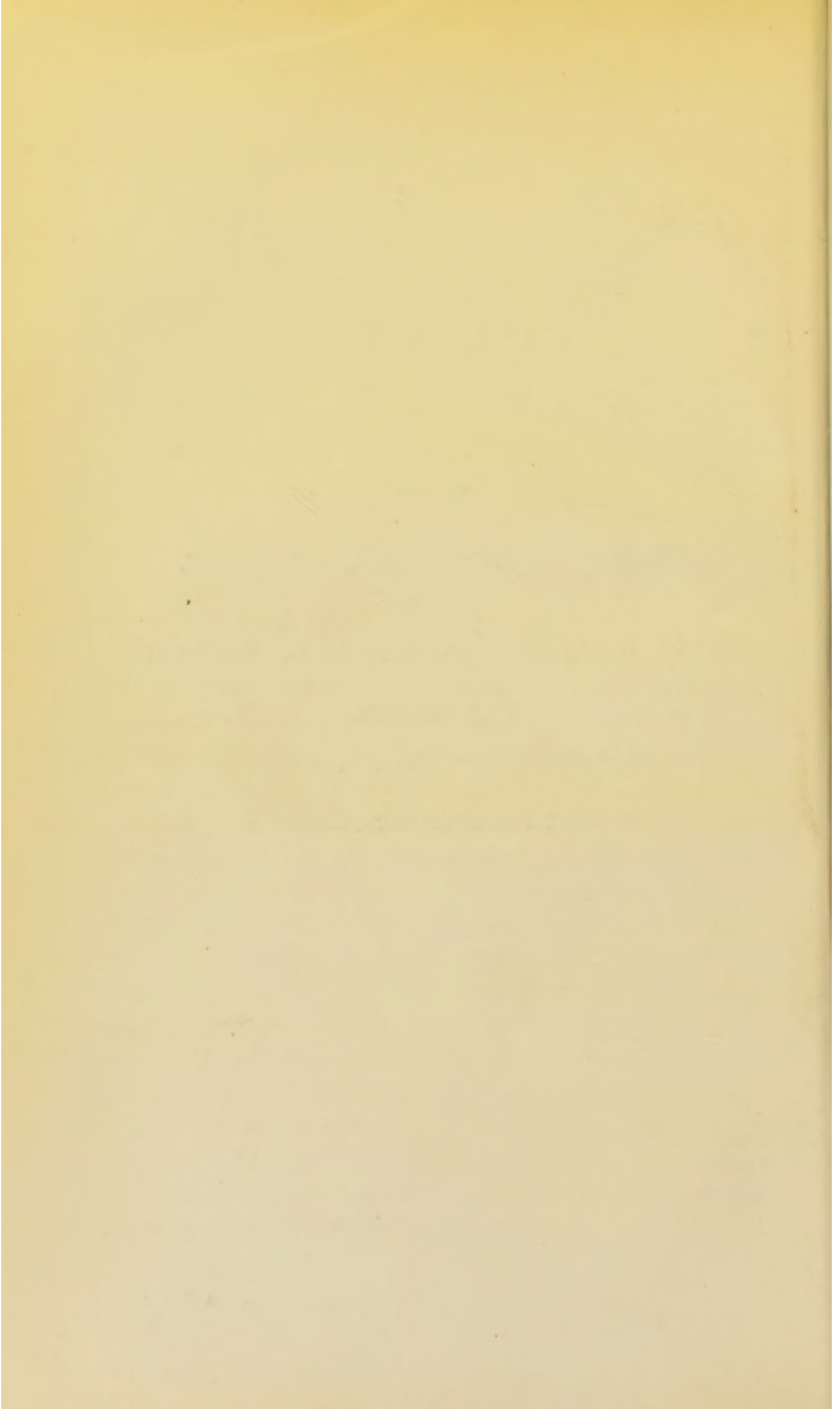
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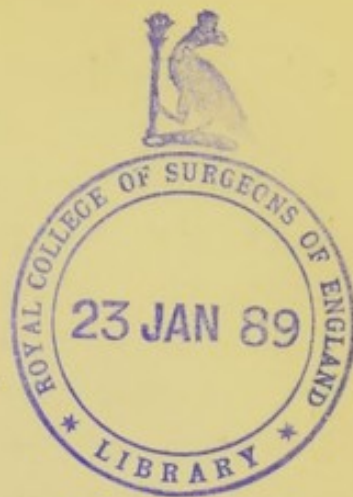


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TO THE  
PRESIDENT, VICE-PRESIDENTS, AND COUNCIL  
OF THE  
ROYAL COLLEGE OF SURGEONS OF ENGLAND  
THIS LECTURE  
DELIVERED AND PUBLISHED BY THEIR DESIRE  
IS MOST RESPECTFULLY DEDICATED



CANCER  
AND  
CANCEROUS DISEASES.



MR. PRESIDENT AND GENTLEMEN,

Last year Sir James Paget delivered for the first time the Morton Lecture on cancer and cancerous diseases. He dedicated his published lecture to Mr. John Thomas Morton, of Caterham Valley, 'with sincere respect for his benevolence and generosity,' and expressed the hope, which he believed Mr. Morton entertained, that this lectureship may lead to some practical utility, 'perhaps even to the finding of a method for the prevention or the cure of these diseases.' No body of men can be more anxious to assist in the attainment of this philanthropic desire than are the fellows and members of this college. Not one of us needs to be reminded of the almost overwhelming importance of the subject. Cancerous diseases are as heart-breaking to the surgeon as they are mysterious and terrible to the public. And additional reasons for urging the importance of their study now may be found in the fact that, notwithstanding the great advance in sanitary science and the prolongation of the average length of human life—in



spite of the shortening of the duration and the lowering of the mortality of some diseases, the prevention, almost the stamping out, of others—cancerous diseases, so far from being less prevalent or less fatal, are increasing among us. The increase in the number of deaths from cancer is now, and has been for many years past, greater than the proportional increase of population. Doubts have been expressed whether this increase is real or only apparent, and due to more complete and accurate registration of the causes of death. This is such an extremely important question that I feel bound to ask for your attention for a few minutes while I lay before you some facts which may assist us in arriving at the truth. The forty-seventh annual Report of the Registrar-General of Births, Deaths, and Marriages in England was presented to Parliament in 1886. It contains returns of the deaths in 1884, and we find that the mortality from cancer was higher in that than in any previous year. We also learn that in three successive periods of ten years from 1851 to 1880, and in the seven following years to 1887, there has been a gradual increase of mortality from cancer—an increase common to both sexes, but considerably greater in males than in females. Up to the age of twenty-five, the cancer mortality is small in both sexes, but at all age-periods after the twenty-fifth year the mortality is much higher of females than of males; and in both sexes there is a rapid rise of cancer mortality at all ages after twenty-five years. I am very unwilling to trouble you with figures, and yet the story they tell of increased and increasing mortality from cancer in England and Wales is so full of interest that I feel bound to ask you to glance at the tables before you, which I have prepared

partly from published reports, and partly from information kindly supplied to me officially.

The first statement I wish to place before you is the fact that the number of deaths from cancer in England increased from 7,245 in 1861 to 17,113 in 1887. We know that the population increased largely during the same period; but, making the necessary correction for increase of population, and estimating the proportion of deaths from cancer to one million persons living, we arrive at remarkable results. This table shows the number of deaths from cancer in England to one million persons living in the last twenty-seven years, and I am able, through the kindness of Dr. Grimshaw, to compare the Irish and English returns for the last eleven years:—

Year	England	Year	England	Ireland
1861 . . . . .	360	1875 . . . . .	471	—
1862 . . . . .	361	1876 . . . . .	473	—
1863 . . . . .	361	1877 . . . . .	488	350
1864 . . . . .	386	1878 . . . . .	503	360
1865 . . . . .	372	1879 . . . . .	502	340
1866 . . . . .	385	1880 . . . . .	514	340
1867 . . . . .	392	1881 . . . . .	520	370
1868 . . . . .	402	1882 . . . . .	532	370
1869 . . . . .	417	1883 . . . . .	546	400
1870 . . . . .	424	1884 . . . . .	560	390
1871 . . . . .	423	1885 . . . . .	566	390
1872 . . . . .	436	1886 . . . . .	583	410
1873 . . . . .	444	1887 . . . . .	606	430
1874 . . . . .	461			

I think it hardly possible that this steady increase in twenty-six years from 360 to 606 deaths from cancer among each million persons living in England and Wales during that period can be truly attributed to any great extent to better registration. You see that in some successive years the mortality is almost exactly the same ;

but, on the whole, the increase is much more steady and regular than any modification is likely to have been in the views or habits of those who certify and those who register the causes of death.

And if we arrange the figures in groups of years—three, five, and seven years—from 1858 to 1887, the same steady increase is even more manifest. Here is the annual death-rate from cancer to a million persons living from 1858 to 1887 and a comparison with Scotland for five of these periods :—

	England and Wales	Scotland
Three years (1858-60) . . . . .	335	—
Five „ (1861-65) . . . . .	368	404
Five „ (1866-70) . . . . .	404	428
Five „ (1871-75) . . . . .	446	468
Five „ (1876-80) . . . . .	495	504
Five „ (1881-85) . . . . .	545	540
Two „ (1886-87) . . . . .	595	—

A glance at the first table shows that up to 1884 the mortality had reached 560, but was up to 606 in 1887. These are the returns of all ages. If we disregard the few deaths in the earlier years of life, and confine our attention to the deaths in persons of twenty-five years of age and upwards, we may compare the period of thirty years before 1880 with the seven following years.

Here is the comparison:—

	Both Sexes	Males	Females
Thirty years (1851-80) . . . . .	867	561	1144
Seven „ (1881-87) . . . . .	1229	895	1533

Surely this great increase in recent years, both among males and females, suggests an urgent need both for inquiry and explanation. I should remind you, before passing on, that if the English population consisted of an equal number of males and females, the

annual death-rate from cancer per million of persons of both sexes, aged twenty-five years and upwards, would be 1,214 instead of 1,229.

In order to compare England with Ireland, I have examined the last Report of Dr. Grimshaw, the Registrar-General for Ireland, and with his obliging assistance have prepared this table, which shows what the total deaths from cancer have been in England and Wales and Ireland in the eleven years 1877-1887 at all ages :—

Year	Deaths in England and Wales	Deaths in Ireland
1877 . . . . .	12,061	1,873
1878 . . . . .	12,594	1,913
1879 . . . . .	12,722	1,782
1880 . . . . .	13,210	1,775
1881 . . . . .	13,542	1,909
1882 . . . . .	14,057	1,882
1883 . . . . .	14,614	1,995
1884 . . . . .	15,198	1,947
1885 . . . . .	15,560	1,925
1886 . . . . .	16,243	2,029
1887 . . . . .	17,113	2,067

On the whole, a smaller increase in eleven years in Ireland than in England and in some years a diminution in Ireland. If we inquire how this is affected by the number of the population, we find that an increase of the number of cancer deaths from 1,873 to 2,067 corresponds with a diminution in population of nearly half a million; and if we calculate the death-rate from cancer, not in persons of all ages, but in those aged twenty-five years and upwards, we find that the deaths from cancer registered in Ireland during the seventeen years 1864-80 are equal to an average annual rate of 676 per million of the living above twenty-five years of age; while those registered during the seven years 1881-87 yielded an average rate of 873 per million. Pray

observe—before 1880, 676 per million, and since 1880, 873—surely a remarkable increase, though not so great as in England.

The only years I have yet been able to compare Scotland with Ireland and England are 1883 and 1885, and the figures are—

Year	England	Scotland	Ireland
1883 . . . .	546	550	400
1885 . . . .	546	569	390

These figures represent the proportionate number of deaths to each million of living persons. If we ask only for the total number of deaths from cancer we find that in 1885 there were in Scotland 789 male and 1,384 female deaths—equal to 560 in each million living at all ages—slightly larger than in England, and much larger than in Ireland. In Scotland, with a population smaller by about one million than the Irish, there were some 200 more deaths from cancer. Dr. Cunyng-hame, in his Report to the Registrar-General for Scotland, remarks that the mortality is highest in Edinburgh and the large town districts, and the proportion varies very much; for while in Edinburgh 49 of every thousand specified deaths are from cancer—in Aberdeen there are 43; Perth, 35; Dundee, 28; Glasgow, in different districts, 21 to 19. Considering that there are large hospitals both in Glasgow and Edinburgh, the fact that deaths from cancer were in 1885 proportionately more than double in one city than in the other is a matter for careful inquiry. By referring to the table of cancer mortality in groups of years from 1861 to 1885 a comparison may be made with the English returns for part of the time—the general result agreeing pretty closely

with the Scotch—and both showing a considerable excess over Ireland.

In the United States the recent increase of mortality has been as great as in England. According to Dr. Fordyce Barker, whose reputation here is as deservedly high as among his own countrymen, the mortality from cancer in the City of New York has risen from 400 to the million in 1875 to 530 to the million in 1885. Discussing this increased frequency and mortality of cancerous diseases 'in those nations which are the most advanced in civilisation,' Dr. Barker says that in America these diseases are much less frequent in the coloured than in the white race. Hence the mortality is less in the Southern than in the Northern States. 'It causes the greatest proportion of deaths where there is the greatest proportion of people of advanced age—that is to say, in the New England States. Hence, in any given locality, a large proportion of deaths from cancer indicates, to a certain extent, that the locality is a healthy and long-settled one, and has a large proportion of inhabitants of advanced age.' In this country, it would appear that, although the liability to death from cancer advances rapidly with age, as does the liability to death from other causes (in the words of our Registrar-General), 'the characteristic feature of cancer mortality is not its increase with advance of years, for this it shares with other fatal affections, but its disproportionate increase in the middle periods of life.'

The fact that these diseases destroy their victims during the most active and useful periods of life surely adds to the importance of studying their causes. When we learn more of their natural history, we shall know

better how to avoid or prevent, perhaps to cure them ; and we require more information, not only as to the geographical distribution of these diseases in general, as compared with the ages, sexes, and occupations of the populations of different areas, for a sufficient number of years ; but it is of equal, perhaps of greater, importance to ascertain how they affect different organs according to locality, race, and habits. For example, cancer of the breast and of the womb may be more accurately recognised, during life and after death, than many other forms of cancer ; and if increasing mortality of these seats of the disease were registered in country or any district, it could hardly be denied on the plea of erroneous diagnosis. I may mention a very remarkable fact which seems to prove that in one city at least deaths from these two forms of the disease are not increasing. The city of Frankfort-on-the-Maine is renowned for the completeness and accuracy of its statistics of population, and Hirsch says—in his valuable work on ‘Geographical and Historical Pathology’ (translation for the New Sydenham Society, p. 508): ‘There has not only been no increase during the twenty-one years 1863–83 in the frequency of those forms of cancer which can be most accurately diagnosed during life or after death, namely mammary and uterine cancer, but indeed a considerable decrease when we allow for the fact that the population has almost doubled during that period.’ The British Medical Association addressed the Registrar-General last year, arguing that ‘the only means which offer a reasonable prospect of discovering how far the increase in the deaths from cancer is real or only apparent, lies in the tabulation, through a course of years, of the cancers of

each part of the body separately.' In support of the application for such additional returns, the Association urged that they might lead to further knowledge of the causes of the disease, and said: 'Your returns have already shown that the increase is greater among men than among women; you may further discover that men of certain trades and employments are more liable than others to the disease, that cancer of certain organs is increasing, while that of all other parts of the body remains stationary, with similar information of equal, or even greater, value' ('Brit. Med. Journ.,' Nov. 12, 1887).

The Registrar-General in his reply relied upon what he called 'the great and regrettable lack of precision with which very many members of the medical profession state causes of death in their certificates,' as one reason for not tabulating under any but 'wide and general headings.' Another plea, that he cannot entertain any proposal which would lead to the employment of additional clerks, is surely feeble. No Government could refuse some slight addition to the Estimates for a really useful purpose. The opinion, as stated by Dr. Ogle, that some part of the increased mortality under the heading 'Cancer' is due to 'improved diagnosis and more precise statement of cause' may be quite true; but it is believed that more detailed statistical returns would assist us in determining whether these reasons account for little or for much of the increase and for how much. I can hardly doubt that the required information for England and Wales will be obtained if the Registrar-General has sufficient funds placed at his disposal by the Government. Dr. Grimshaw, the Registrar-General for Ireland, has already begun to



obtain and supply the needful information. In his report for the year 1887 he has published a table which shows the deaths from cancer registered during the year, by sexes and age-periods, arranged according to the part of the body affected by the disease, so far as that information was contained in the returns. In 406 cases, the organ or part of the body affected was not stated, and it is important to note that of the 1,661 cases where the required information was given, 507 (or nearly a third) were from cancer of the stomach. As twenty-nine other cases are returned for the pylorus, the proportion is still larger. There were 203 (or about an eighth) from cancer of the breast; and 161 (about a tenth) from cancer of the uterus. Next in order follow the liver, tongue and lips, throat, intestines and rectum.

When we are able to compare such returns from Ireland with similar information from England, Wales, and Scotland, we may surely be assisted in our study of the causes and prevention of these diseases.

I am sorry that I cannot do more than ask you to glance at Mr. Haviland's interesting charts, which show how very greatly the geographical distribution of cancer and phthisis differ in Great Britain. His writings on this subject merit your careful attention, especially those in the first volume of the 'Lancet' for this year.

It would be unjust to Dr. Ogle if I were not gratefully to acknowledge the value of much that he has already done, and accept it as proof that more will follow. His observations on the varying mortality from cancer in the different counties of England, on the excessively high cancer mortality in London and the surrounding counties, and in many of the counties on the eastern half of the kingdom, and his cautious exa-

mination of the truth of the widely spread belief that 'cancer mortality is lowest on the western side and highest on the eastern side of England,' merits our hearty thanks. If the Registrar-General have power enough, and the expenditure of his department is not stinted, there is ample ground for hope that all required information will be obtained and given. But we must also do our own share of the work. Complaints, not altogether unfounded, are made that the profession does not supply the necessary data for accuracy of statement. It is said that not only country general practitioners, but men of high standing in London, and officials in our great hospitals, are very careless in the matter of filling up death certificates, and yet are angry when they cannot find the precise detailed statistics they desire to obtain. All this is worthy of your careful consideration, and I cannot think I am wrong in the confident belief that hereafter members of our profession in all parts of the country, as well as our associations and medical societies, will assist the Government by freely giving their careful attention to the accuracy of the returns they make as to the causes of death, and will assist willingly and to the best of their power in the attainment of an object of such national importance. Although some inquirers have not yet obtained all the statistical information they want, I do not think it can be denied that—in regard especially to cancer—there are no statistics in the whole range of medical literature which can be compared, for fulness or for accuracy, with those given in our Registrar-General's last Annual Report. Not only are those returns founded on a far wider basis than any others, but they stand alone as the only statistics of cancer in which the necessary correction for

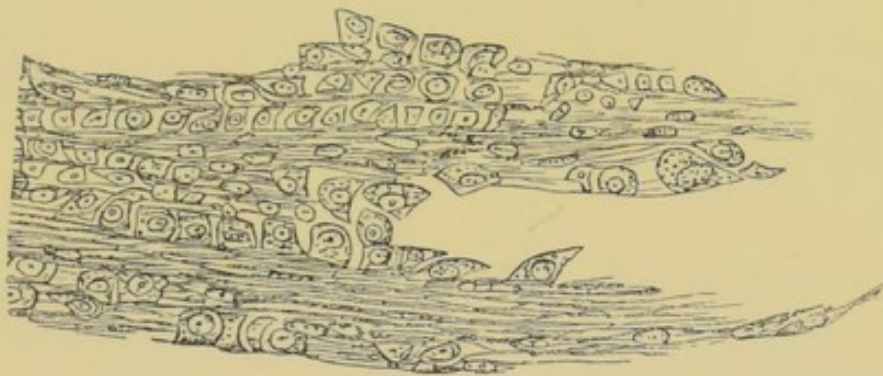
age-distribution has been made—a correction without which all statistics as to the comparative frequency of cancer in the two sexes, or in different geographical areas, are almost valueless.

The time and attention you have given to these figures, and the inferences drawn from them, will not be lost if you are led, by the belief that cancer and cancerous diseases are increasing, to ask, Can the increase be checked? What are our duties as surgeons in relation to these diseases in general, and to their surgical treatment when different organs or parts of the body are attacked by them?

Upon the general question of the nature and causes of these diseases, of their prevention or the means of checking their increase, I can only speak in the most hasty manner—partly because I could add very little to what Sir James Paget said last year and to the concluding sentence, Mr. President, of your own Bradshaw lecture in this place. You there say, ‘Before we shall ever be able to answer the question, Why or how do tumours form? we must be able to solve the problem of normal growth and development, and to answer the question, Why or how it is that these continue up to a certain point, and then suddenly cease?’

If I were to attempt to add to this, it would be necessary to review the progress of scientific pathology in our own time, and to criticise what is known, or believed, or taught in our schools, of the processes which lead to the formation of new growths, especially of those growths which are in their character infiltrating, spreading, invading, encroaching upon or supplanting, surrounding structures, and which may

secondarily affect distant parts of the body. The problem is, how these growths take the place of normal tissues or structures, how their cellular elements appear in the interstices of normal textures, how the normal cells are altered or transformed, how the infecting cells are only misplaced and proliferating epithelium, not new elements, but imperfect or morbid epithelium which has acquired the power of infecting the neighbouring cells, or of impressing upon them an epithelial



type. You see in this drawing 'cancer-cells' arising interstitially from connective tissue cells which had reassumed their embryonic plastic character. This is the teaching of Virchow, and, though not easy to explain, seems to be in accordance with what the microscope shows us. These are problems which it would be hopeless to attempt to discuss in an hour. If we go a little further back, and study the whole cycle of changes from the cellular rudiments of organs and tissues, through their normal growth and development towards their natural decay and death, and bear in mind the liability of some of these organs to premature obsolescence, the occasional persistence or return to embryonic forms or powers, and the risk attending the survival in the body of rudimentary structures, we open

a fruitful line of inquiry. And if we combine the study of this elemental and cellular pathology with that of the changes in the blood and blood-vessels and in the nervous system modified or not by the influence of hereditary tendencies, and associated or not with the action of chemical or organic agents introduced from without, with the inoculation and multiplication of micro-organisms, and with the poisonous animal alkaloids and extractive compounds which they secrete and leave behind after their work has been done, we have a new world before us, a boundless sphere for continuous research. I know of no path of original research where more advance is to be hoped for, and none where the assistance freely offered to earnest workers in the new laboratories of this college, which are the firstfruits of the bequest of Erasmus Wilson, is more likely to be rewarded by profitable discovery.

I scarcely need do more than mention the great assistance which workers may obtain from the Museum of this College. In the original Hunterian Collection there were 287 specimens of cancerous diseases. To these, 1,200 have since been added. Microscopic specimens, showing the structure of various forms of these diseases in different organs and tissues, may also be studied in a collection of several hundred prepared by Mr. Eve, who has nearly finished a complete catalogue of the collection. The valuable collection of Hunterian drawings has been enriched, at the suggestion of Sir James Paget, by many illustrations of morbid anatomy. And, quite recently, Dr. Matthews Duncan has presented a large and beautifully executed collection of water-colour drawings of cancerous and other diseases of the vulva. Some of them are on the table,

and will, I hope, stimulate many to follow so good an example.

Although the hour is rapidly approaching its end, I must not pass over without remark recent discussions as to the supposed microbic origin of cancerous growths. Cases of acute cancerosis or miliary cancer, analogous to acute tuberculosis or miliary tubercle, have led to the search for a specific microbe, or bacillus. Scheurlen believes he has found one, but nearly all those who have examined his statements have been led rather to negative than to confirm his conclusions. Senger, indeed, has almost proved that Scheurlen's cancer bacillus is nothing more than a potato bacillus—one which grows readily on slices of potato, and is often accidentally found there. So far as inoculation experiments, or grafting of portions of cancerous growths upon sound parts of the body, have hitherto gone, they are certainly against the microbic doctrine. We can only admit that any disease is caused by a microbe when the micro-organism has been isolated, has been cultivated outside the human body, and then, when the cultured organism has been introduced, it has led to an identical form of disease or growth. Unless these three things are done we have no positive proof that a disease is due to specific germs.

Knowing how keenly such questions as these are now discussed, I was anxious to know if the great leader of German pathologists has yet arrived at any definite conclusion regarding them. So I wrote to Professor Virchow, and he replied on October 25 last, sending me a paper published in his Archives on the 'Diagnosis and Prognosis of Carcinoma,' and adding, 'Since I wrote that paper last December, the only progress in the knowledge

of Scheurlen's bacillus was its detection growing on potato sections without cancerous origin.' Professor Virchow also refers me especially to a part of his paper which expresses his present belief that 'the most scrutinising investigations have not yet arrived at a convincing demonstration.' But, with equal caution, he adds that the possibility of the existence of such a micro-organism cannot simply be denied; and that the discovery of a specific bacillus would be of the greatest importance in the diagnosis and prognosis of carcinoma—because, he says, 'The attempt to explain all the stages of cancer proliferation with dissemination and metastasis by the dispersion of cancer cells is by no means so certainly supported by anatomical or experimental proof as to exclude any other mode of explanation. Nor, on the other hand, is the need for a cancer bacillus so great that without it we are deprived of the possibility of understanding the process. Animal or human cells, quite as well as bacteria, have the power of influencing metamorphosis, and of producing effective secreted matters of the most various kinds. Why then should such an influence be denied to cancer cells, which in many, and especially in the worst cases, are in such a marked degree endowed with the character of gland-cells?'

I would refer any who may wish to study this part of the subject to some extremely valuable papers by Mr. Ballance and Mr. Shattock published in the *Pathological Transactions* for this year and last year, and especially to their reports of cultivation experiments with malignant new growths made to the Collective Investigation Committee of the British Medical Association. Although in their attempts to propagate the disease

by inoculation they have not yet succeeded, they still hold ('British Medical Journal,' October 29, 1887) that 'the parasitic theory in some form or other is the most probable of any of those yet advanced.' What they now desire is that inoculated animals should be kept for the full term of their natural life under healthy sanitary conditions; as the life-history of the parasite may be a long one, and it may be a long time before the characteristic effects of inoculation could be expected.

The time at my disposal is so very short that I must at once pass on to the consideration of our duty as surgeons in treating sufferers from cancerous diseases, and I propose to ask you to reflect at your leisure upon certain questions about which the mind of the profession is still not definitely settled, rather than to accept any conclusions of mine.

The first of these questions is whether a cancerous growth alone, or the whole of the part or organ which it has invaded, should be removed; and I think the time has come to agree upon some general rule or principle of treatment. With regard to cancer of the breast, two very opposite opinions are held by men of high position as hospital surgeons. Mr. Nunn, after very large experience at the Middlesex Hospital, in his admirable treatise on 'Cancer of the Breast,' says (p. 32): 'When an operation has been decided upon, the removal of the entire mammary gland must be complete—any partial removal is not only useless but worse than useless; the occurrence of the slightest speck of cancer in a gland declares that the whole organ is more or less ready for special degeneration.' Mr. Butlin, whose



experience at St. Bartholomew's is also very large, and whose work on the operative surgery of malignant disease is rich in facts carefully tested and in conclusions drawn with remarkable judgment and freedom from prejudice, takes a very different position to that of Mr. Nunn. He says that in many cases the tumours are 'at first of small size, limited to a part of the breast, often situated towards the margin of the gland' (p. 381); and he adds: 'Just as good reason could, I am sure, be given for the removal of both breasts in every case of cancer of one of them, as for the removal of the entire mammary gland in every instance.' Time prevents me from entering further upon this important practical question than to say that my own practice, and what I have actually seen of the practice of others during the past thirty years, would lead me to remove the entire breast in every case of cancer, except where the growths are small and close to the margin of the gland, or only affect outlying portions of the gland. And when such growths are found not in the gland, but in the axilla, I should strongly oppose removal of the breast, because I think such tumours may be neither of the breast itself nor of the axillary lymphatic glands, but of a certain class of sweat-glands which have been the subject of a paper by Dr. Creighton. I believe it is only necessary to direct more attention to this inquiry to lead to the recognition of a new and a large class of tumours of the axillary and pectoral regions.

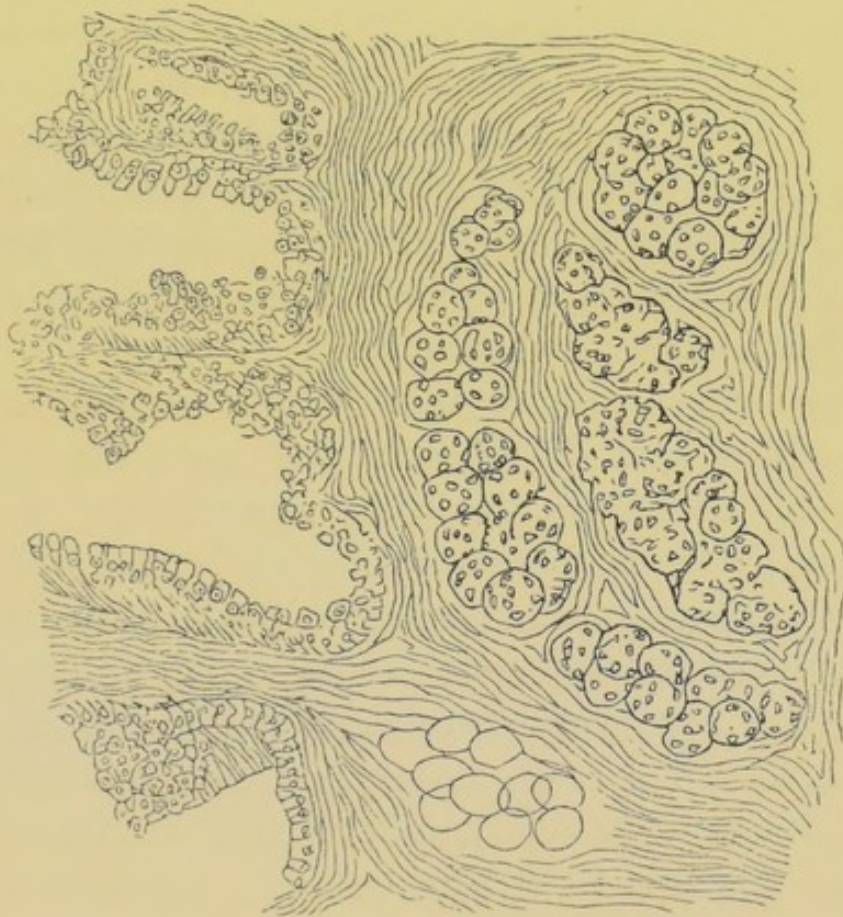
The tumours to which I allude are found at the outer border of one or both breasts, and the surgeon is doubtful whether the breast itself is or is not involved in the new growth. When the growth is between the outer border of the mammary gland and the corre-

sponding axilla, the fear is felt that the axillary glands are involved in the breast disease; and opinions are given that both the axillary tumours and the breast should be removed. Such a case came before me scarcely a month ago. On the 25th of last month, a married lady, who had never been pregnant, 46 years of age, came to me from Wales, having had a strong opinion that her right breast should be removed without delay. I found both breasts larger and harder than usual, both nipples unusually large and prominent, but the only distinct tumour to be felt was between the upper and outer border of the right mamma and the axilla. Extending from this border, below and behind the pectoral muscle, was a round, movable, tender tumour about three inches in lateral and two in vertical measurement. It was in close connection with the mammary gland; but I thought I could separate one from the other. The patient felt sure that a blow from a tennis ball two years ago had been the cause of the swelling. I advised that neither of the breasts should be removed; but that the tumour or tumours, whatever they might be, should be removed without delay. Meeting Dr. Creighton later on the same day, I mentioned the case to him, and he at once suggested that the tumour might be neither of the breast nor of the axillary lymphatic glands, but of certain sweat-glands below the skin of the axilla which he had referred to in connection with tumours in a paper which was read at the Royal Medical and Chirurgical Society six years ago, and may be found in the sixty-fifth volume of the Transactions of the Society. In that paper he shows that the special layer of glandular substance more or less developed in the human axilla corresponds to a

conglobate form of gland not previously described, in one of the lowest mammals, with an investment of unstriped muscular fibres in parallel order around each crypt, so as to constitute a basement membrane upon which the epithelial cells are seated. These sweat-glands differ in important respects from the ordinary skin glands of man. They are not usually in the substance of the skin, but adhere to its under surface, lying between the skin and the axillary fascia, and sometimes extending to the lateral and anterior regions of the chest. They are variously developed in different individuals, and must be regarded as a sort of survival or rudimentary organ, and subject to all the risks of such survivals or rudiments. Dr. Creighton says: 'I have, in one instance, found perfect examples of them in intimate association with the breast structure.'

I show you here the tumour which I removed entire on October 30, as well as the fragments of another somewhat smaller tumour, and the tissue I removed in dissecting away the investing membrane after the interior had been cleared out. Dr. Creighton was present, and made a careful examination on the same day of all that I removed. The smaller or pectoral tumour was so closely connected with the breast that I removed with it a small piece of the outer border of the gland, enough to show that the breast itself was quite healthy. In order to be sure of removing the whole of the tumours, I removed some of the surrounding fat also, and Dr. Creighton reported to me that he found 'embedded' in the fat, round, reddish bodies, about the size of a large pin-head. 'One of these, easily extracted from the surrounding fat, proved to

be a coil or cluster of the tubular axillary glands of perfectly normal structure, in which the characteristic palisade-like basement membrane of unstriated muscular fibres, the mosaic of polyhedric epithelium resting on the latter, and the conglobate windings and crypt-like



This drawing shows the two kinds of gland structure exactly as they are seen in one of Dr. Creighton's preparations. To the right is seen a portion of a mammary lobule in a resting state; and, on the left, a scattered deposit of the so-called sweat-glands, with muscular basement membrane.

recesses of the tubule were easily seen in a preparation of the fresh tissue. The capsule of the smaller and more friable new growth adhered along the axillary side of the piece of fat, the normal reddish cluster of glands lying in the fat about an eighth of an inch

deeper. This capsule was everywhere infiltrated with blood; its inner surface was not uniform, but subdivided into a number of round areas or recesses of unequal size, one or two of which were specially marked by their black pigmentation. The examination of that capsular tissue, and of the friable tumour tissue which was removed from it by the finger during the operation, discovered satisfactory evidence of the same glandular structure as in the small reddish body embedded in the adjoining fat—namely, unstriped muscular fibres, spherical or polyhedric epithelium, with or without brown or black pigment, and, in sections, traces of the tubular glands themselves.

‘The larger mass of tumour was situated deeper in the axilla, and was unconnected with the portion nearest to the breast, except by loose tissue. It was extracted by the fingers entire, an encapsuled lobulated oval body, about two and a half inches in its long axis, and an inch and a quarter across at its thicker end. The surface was everywhere dark red, giving it some resemblance to a small kidney. In its lobulation it looked like a packet of lymphatic glands. On section it proved to be a whitish medullary substance with a few small areas of pigmentation, and with a general foliaceous or lobulated arrangement of the stroma. In microscopic preparations of the fresh tissue, unmistakable examples of unstriped muscular fibres were found, as well as the same polyhedric and spherical epithelium, with and without pigment, as in the more friable tumour nearer to the breast. In sections the epithelial cells were found collected in alveolar heaps, generally of great extent. The dark colour of the capsule was from infiltration of blood.’

The general structure of these tumours of the irregularly scattered sweat-glands, including their hæmorrhagic capsule, appears to be the same that has been described for the puzzling class of cases known as 'alveolar sarcoma of the breast,' or 'duct-cancer of the breast.' It is noteworthy that these cases have sometimes been found to start from the areola around the nipple, a region which is known to be provided with the same kind of tubular glands as are found in the axilla. When such growths ulcerate they resemble rodent ulcer. The so-called eczema of the nipple, which has been observed in such cases, would appear to be connected with the orifices of the gland, and, in its simpler forms, to be little more than the brownish secretion of the glands dried upon the skin. It seems probable that this case, and Dr. Creighton's observations upon it, will be the beginning of a new classification—or of the separation of such cases from the class of mammary tumours, and their reference to the irregular deposits of sweat-glands of the axilla, and to the glands of the areola.

I may add that a tube draining away from the axilla was kept in for three days, and after its removal union of the incision, about four inches long, was complete when the sutures were removed. The patient returned to Wales a few days after the operation. I have arranged for a report as to any recurrence hereafter, but venture upon a favourable prognosis.

Again, we may be consulted in cases where the period for early and hopeful operation has passed by, or where, months or years after operation, recurrence has taken place—it may be that recurring growths have also been removed, once or several times—and

then comes a time when a patient, exhausted by loss of blood, or by profuse offensive discharge, approaches the end, and further operative treatment is abandoned. Are we to be content with relieving pain, prolonging sleep, and the use of deodorising or disinfecting appliances, or can we do more? Can we encourage the forlorn hope of the patient that growth may still be stopped? that some benign alteration may take place in its structure—something like the ‘spontaneous involution’ of Virchow—some retrograde fatty change in the cells or elementary components of the tumour, while extension or growth of new cancer cells is stopped? If this could be attained before other parts of the body were infected it would amount to curing cancer. From time to time such cases of cure are reported, but few, if any, stand the test of accurate investigation. Virchow, however, cautions us against too great scepticism in such therapeutical investigations, and says that the hopeless condition of the patient justifies the trial of remedies of whose mode of action we have no clear idea. Whether we can go still further, and secure for healthy tissues immunity against infection from an existing cancer—a resistance to invasion—remains a subject for future inquiry. All we can yet say is, that under certain conditions the nutrition of cancer cells may be so far arrested as to lead to their complete disintegration. This is often observed in small fragments, or within a limited circumference, and Nussbaum has recently succeeded in the attempt to effect such changes in larger growths by cutting off their supply of blood. He makes deep furrows with Paquelin’s cautery through the integuments and subcutaneous fat quite down to the adjacent fascia or

muscles, thus cuts off all peripheral supply of blood, and so lessens the abnormal vascularity of many malignant tumours. Soft fungoid masses which bleed readily soon become firm, and the whole tumour more solid, while the general health improves and life is prolonged. And we also hear from Munich of aims at a somewhat similar object by injecting solutions of ozone into the substance of cancerous growths and the tissues surrounding them. Not only is the proliferation of the epithelial cells said to be arrested, and the formation of cicatricial tissue obtained, but the surrounding textures are protected against invasion. So long as the disease is local it must be curable. As Virchow says in concluding his last paper, 'If cancer in its beginning, and often very long afterwards, is a local disease, it must be possible during this period locally to cure it.'

When a superficial cancer on a limb has returned after destruction by cauterisation or caustics, or after removal by the knife and grafting of healthy skin, and the lymphatic glands nearer the body remain free from infection, the propriety of amputating the limb must become the subject for consultation. It will sometimes be the painful duty of the surgeon to urge upon a reluctant patient to sacrifice a limb in the hope of saving life; and if this advice is followed before infection of the glands has taken place, the result has often proved the soundness of the advice; while too great delay, or want of earnestness in urging submission to so serious an alternative as the loss of a limb must always be, may lead to protracted suffering and inevitable death.

I have yet another subject for your consideration, one which the general public enters into with a good



deal of warm feeling and an amount of ignorance which calls rather for instruction than blame. I mean the removal of cancerous growths by cauterisation instead of by the knife. On this point let me read to you what our great master, John Hunter, said just a hundred years ago (Palmer's edition of his works, vol. i. page 625) as to cures for cancer:—

‘No cure has yet been found; for what I call a cure is an alteration of the disposition and the effect of that disposition, and not the destruction of the cancerous parts. But as we have no such medicine, we are often obliged to remove cancerous parts, which extirpation, however, will often cure as well as we could do by changing the disposition and action. Arsenic seems to have some power of this kind, and its effects might be increased, by being used internally and externally; but its use is very dangerous, and I am afraid insufficient for the disease. This is a remedy which enters into the empirical nostrums which are in vogue for curing cancer; and among which Plunkett's holds the highest rank. But this is no new discovery, for Senertus, who lived the Lord knows how long ago, mentions a Roderiguez and Flusius, who obtained considerable fame and fortune by such a composition. I was desired to meet Mr. Plunkett, to decide on the propriety of using his medicine in a particular case. I have no objection to meet anybody. It was the young one: the old one is dead, and might have died himself of a cancer for aught I know. I asked him what he intended to do with his medicine. He said, “To cure the patient.” “Let me know what you mean by that. Do you mean to alter the diseased state of the parts, or do you mean by your medicine to remove the parts

diseased?" "I mean to destroy them," he replied. "Well, then, that is nothing more than I or any other surgeon can do with less pain to the patient." Poor Woollett, the engraver, died under one of these cancer-curers; he was under my care when this person took him in hand. He had been a life-guardsman, I think, and had got a never-failing receipt. I continued to call on Woollett as a friend, and received great accounts of the good effects, upon hearing which I said, if the man would give me leave to watch regularly the appearance of the cancer and see myself the good effects, and should be satisfied of its curing only that cancer (mind, not by destroying it), I would exert all my power to make him the richest man in the kingdom. But he would have nothing to do with me, and tortured poor Woollett for some time, till at last I heard the sound testicle was gone, and at length he died.'

How this story of John Hunter reminds us of much that goes on every year in this great city! More than thirty years ago, in 1857, I published a lecture on the cancer-curers of that day—Pattison and Fell, Landolfi and the Black doctor, Beveredge and the Rev. Hugh Reed. I believe the exposure of Mr. Reed's practice did much to prevent other cancer-curers from doing much harm in London. But there are still irregular practitioners heard of, who follow the line of Plunkett, Pattison, and Fell, who profess not only to destroy a cancerous tumour, but also what they call its roots, and thus prevent a return; or, as Fell professed, to destroy the 'tendency existing in many cases in the constitution for the reproduction of cancerous cells,' and to 'destroy the cancerous diathesis.' It is curious to compare this

claim with John Hunter's remarks on the use of arsenic to 'destroy the cancerous disposition,' with Mr. Hutchinson's recent observations on 'Arsenic-Cancer,' and with Dr. Creighton's views on arsenic among other alterative or 'habit-breaking' drugs, metals, or metalloid substances having elective affinities for particular tissues; and his theory of cancer as an acquired habit of the tissues, 'a habit that might be broken if we only knew how.' The inhalation of oxygen and the use of oxygenated water as a beverage have been supported upon somewhat similar grounds, and did no harm beyond disappointing the patient. But as a fashion its day was short. The use of methodical compression, which often did good, has led to the more modern *massage*, which has already done much harm. On looking over my old lecture I find this sentence: 'I should not be at all surprised to hear that the next great empiric who appears in London will profess to cure cancer by galvanism.' I have been surprised that this advent has been so long delayed, although there have been proofs of late that female galvanic doctors are at work, and others calling themselves electro-homœopaths, doing some harm, but not deserving the title of great empirics. While writing this, I hear of certain cancer-curers whose head-quarters are at Brussels, but who have correspondents in London and Southampton, whose practice leads to results quite as bad as any of those of Pattison and Fell. I must not pursue this rather tempting subject further than to repeat my assertion that 'we have no reason to fear a comparison between what we can do by fair and open means and what really can be done or ever has been done by any cancer-curer or any secret remedy.'

More than ten years ago, in June 1878, lecturing in this theatre, I gave a short account of Freund's method of entirely removing a cancerous uterus through an incision in the abdominal wall, and referred to Blundell's four cases of removal through the vagina. I then said I thought it would be rarely that an entire uterus affected by cancer would be removed by laparotomy; and I need now only add that the results of the practice have been so disappointing that it may be said to be practically abandoned. I have only twice removed the entire uterus by laparotomy, and the specimens in both cases are on the table before you. One is of some historical interest as having been the first instance in this country of excision of the entire gravid uterus. The patient was six months pregnant, and suffered from epithelioma of the cervix uteri. You see the entire uterus and the ovaries, just as they were removed, and the opening through which the fœtus was extracted. The patient recovered from the operation and was in fairly good health for several months; but the disease recurred in the left iliac fossa, and death took place thirteen months after operation. The other case was much more satisfactory. A patient at the full term of pregnancy had her pelvis so blocked up by a uterine tumour that delivery was impossible. You see the uterus which I removed with both ovaries, and the cavity from which a living child was extracted. Recovery was as rapid as after a natural labour, and I received a photograph of mother and child a year after the operation, both being quite well. I need say no more of these cases, as they have both been published, except that they have proved that in case of need the entire uterus, containing a fœtus or a viable child, with considerable

tumours, and with both ovaries, may be successfully removed through the abdominal wall.

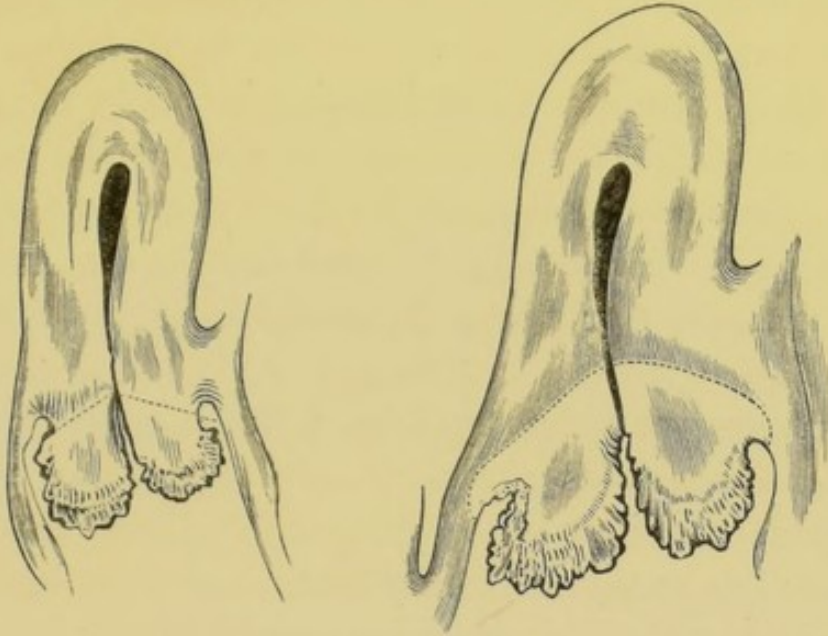
Removal through the vagina is a much more successful operation. It did not attract serious attention in England until after a discussion at the Obstetrical Society in March 1885, where it may be said to have been generally condemned. In the report of that discussion I find the following remarks of my own:—

‘It is to be hoped that at least as good results may be obtained here as in Germany, and that condemnation of the principle of the operation will not be the verdict of the Obstetrical Society. Have we sufficient facts before us to justify such a verdict? Admitting that abdominal extirpations have resulted in a mortality of 72 per cent., and vaginal extirpations of 28 per cent., is it to be supposed that improved methods will not lead to diminishing mortality? Admitting that recurrence of the disease within a few months, or, at most, in from two to five years, has hitherto been the rule, may not a more accurate diagnosis, earlier operations, and improving methods lead to better results: not only to a lower death-rate, but to a retarded recurrence and sometimes to complete recovery?’

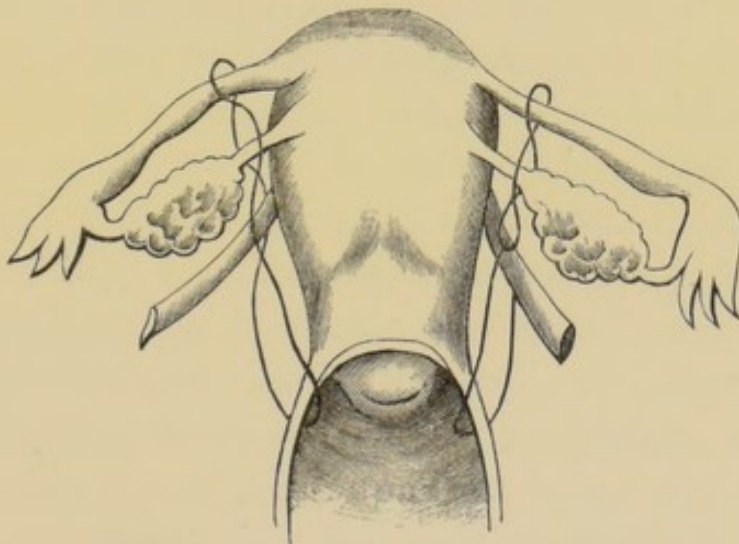
It will hardly be disputed now that the mode of operating has been improved and that mortality has diminished; and I think I cannot employ the few minutes still allotted to me better than in rapidly sketching what I believe to be the best mode of operating, and in bringing before you the results already attained by experienced operators.

But I must first say a few words comparing removal of the entire uterus with removal of the diseased part only, by the operations known as infra-vaginal and

supra-vaginal amputations. These diagrams show what is meant by these alternative proceedings :—



Of course it must be difficult to draw a very definite line, and say exactly where one or other of the two operations begins or ends, but these are near enough



for all practical purposes, and if they are compared with this other diagram after Freund, showing what is done

when the entire uterus is removed, both Fallopian tubes and both ovaries being left behind, a very good idea may be formed as to the comparative gravity of the different procedures.

In many cases of total extirpation it may be advisable to remove both Fallopian tubes as well as the uterus, and in some cases one or both ovaries should also be removed. This will, I need hardly say, depend upon the healthy or diseased condition of the different parts.

I am sure we are not yet in a position to compare numerically the risks of partial or total excisions neither as regards the immediate danger of death from the operation nor as to the liability to recurrence at longer or shorter intervals. This must be done at some future time when we have a larger number of cases accurately observed and faithfully recorded. At present I can only offer a general statement that in my own practice, when the disease is strictly limited to the parts near the os, I prefer infra-vaginal amputation, and I do it by the galvanic cautery *écraseur*, using the wire at a low red heat, and tightening the loop very slowly. I have removed nearly the whole of the cervix in this way without losing one drop of blood. A white dry eschar is left, and cicatrisation follows without fever or much pain. When disease has extended rather higher, amputation must be done with knife or scissors, but it is well to cauterise the raw or bleeding surfaces by copper or gas cautery or Paquelin's, to serve the double purpose of checking bleeding and destroying any infective cells that may possibly have invaded the tissues above the line of amputation.

Before passing on to the details of the operation of

total excision, I must say a few words as to the use of caustics rather than the knife, scissors, or cautery. Potassa fusa has been largely used in this way, and I have heard of, but never seen, very good results following. And I have seen several cases treated by the late Dr. Wynn Williams with bromine. But not one ended satisfactorily, although temporary good was done. On the table is a very remarkable specimen of the entire uterus which sloughed away after the use of chloride of zinc. Dr. Marion Sims carefully scraped away with his curette all the diseased structure till he came upon hard uterine tissue. Then he applied persulphate of iron upon cotton wool, left this for twenty-four hours, removed the styptic plug, applied another plug of wool charged with a strong solution of chloride of zinc, and left this for four days. After removing this plug, antiseptic vaginal injections were used for several days, and then I found this mass quite loose in the vagina. It consists of the entire uterus, and when fresh it was quite evident that some of the peritoneal coat of the fundus came away with it. The patient suffered a great deal, and died about two months after the application of the caustic; sooner, I believe, than if she had been left alone.

After what I have said it cannot be surprising that in any case where cancerous disease has extended much higher than the os, and there is good reason to believe from the mobility of the organ that the surrounding tissues are still free from invasion, I advise total excision as the best practice. And increasing experience is materially simplifying the operation. I cannot pretend now to describe the different steps in detail, and I need only allude to the importance of preliminary disinfect-



tion of the vagina, removal of any dead or softening cauliflower excrescences, and shaving off all hair from pubes and vulva. This may be done the day before operation.

During the operation the patient is fixed in the lithotomy position by anklets and wristbands, or by a thigh crutch; and a douche and elastic tube are so arranged that a stream of warm, slightly-carbolised water may continually irrigate the vagina. The body is well covered, as well as the arms, legs, and feet, to prevent chilling. If the uterus is fairly mobile, no speculum is required, at most one or two retractors. Some operators draw down the uterus by a simple or double hook, or by hooked forceps; but if the cervix is firm, any friable part having been cleared away, the safest plan is to pass a strong wire quite through the cervix. This is safe, and not so likely to be cut as silk. Supposing that any intention of turning the fundus either forward or backward is, as it ought to be, abandoned, the cervix is pulled by the wire towards the vulvar orifice, the labia held aside, and the sides of the vagina separated if necessary. The operation is completed by different stages.

1. Division and loosening, and pushing up to the extent of half to three quarters of an inch, of the vaginal mucous membrane behind and in front of the cervix.

2. Pushing upwards or separation of the bladder and ureters from the neck and anterior surface of the body of the uterus.

3. Opening Douglas's pouch, and introduction of a sponge to keep up the small intestines.

4. Securing the uterine arteries on both sides by ligature or by pressure forceps.

5. Division of the broad ligaments and other attachments, and removal of the uterus.

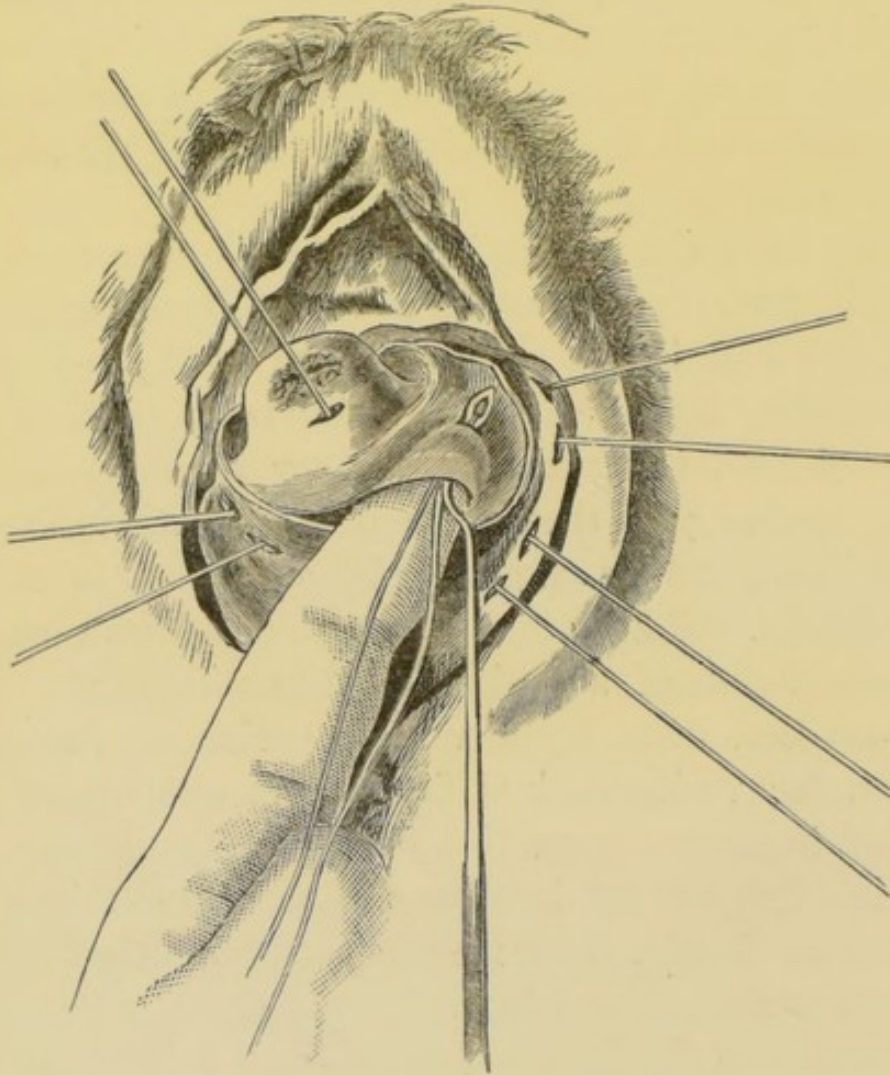
6. Cleansing vagina, removal of sponges, arranging ligature threads or forceps, and loose plugging with iodoform gauze.

It is unnecessary to such an audience as this to enter into further detail; but I will refer briefly to two matters of great importance—the safety of the bladder and ureters, and the substitution of forcipressure for the ligature.

Sometimes the separation of the bladder from the uterus is quite easy, sometimes very difficult, and I am sure great care is always required to avoid the ureters. In several recorded cases one, and in more than one case both ureters have been tied or divided. I need hardly remind you that one mode of death in uterine cancer is uræmic coma, caused by closing up of one or both ureters. And I show you here the parts removed after the death of a patient from uræmic coma. She was operated upon by a very experienced American surgeon for vesico-vaginal fistula, yet one ureter was included in the sutures which closed the fistula, and the other was left opening into the vagina behind the united edges of the fistula. In some recorded cases the bladder has been wounded, and in others the catheter or sound passed through the urethra, and used as a guide to the separating finger or to pull the bladder forward, has been seen through the thin muscular coat and mucous membrane of the bladder.

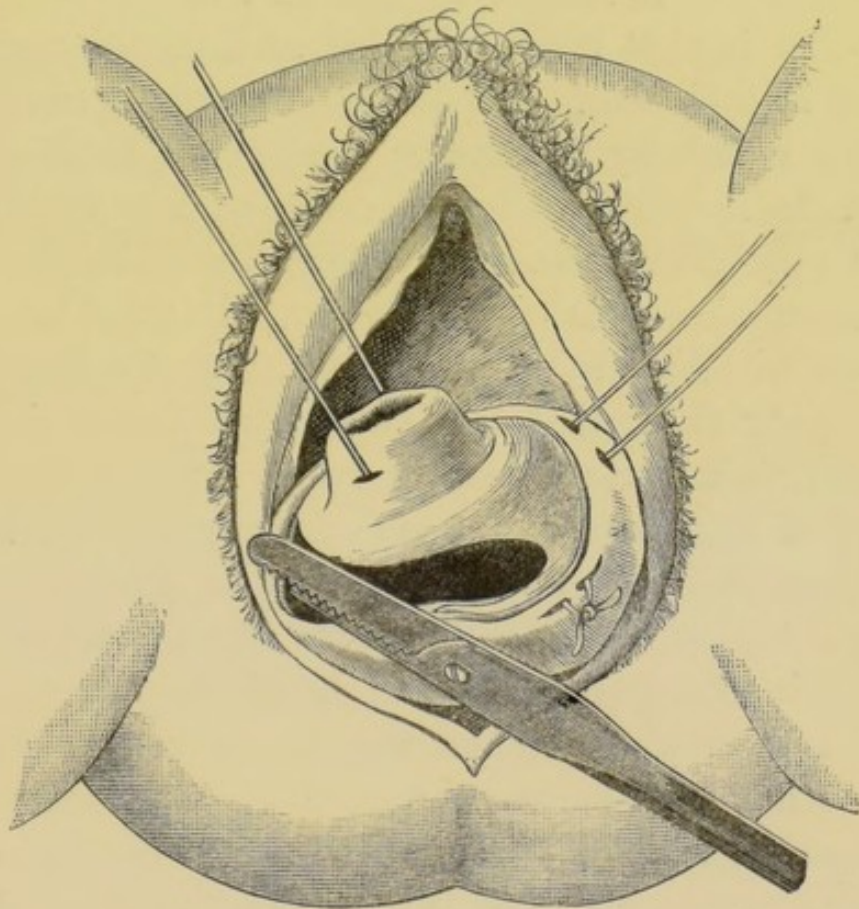
In one of these drawings the mode of passing one of the ligatures used to secure the uterine arteries is shown—a threaded blunt needle is guided by one finger passed into Douglas's pouch. One or more may after-

wards be passed in the same way to secure the broad ligament on either side, or the same object may be gained by the use of pressure-forceps, as shown in the next drawing. These are not removed, but are left on for twenty-four, thirty-six, or forty-eight hours until all



danger of bleeding has ceased. Leopold and some German operators prefer the ligature. Péan, Richelot, and other Frenchmen trust to the forceps. I believe I was the first to suggest their use, and one of our Fellows, Mr. Jennings, the first in this country to carry out the suggestion with success. Some warm controversy has

arisen in Paris lately on this matter, and Dr. Pozzi in a small work on vaginal hysterectomy for cancer just published puts the historical question as follows. After quoting what I wrote in 1882 ('Ovarian and Uterine Tumours,' p. 526) recommending the 'securing any bleeding vessel as it is divided by pressure-forceps, not



using any ligatures, but leaving the forceps hanging out of the vagina for two or three days until all danger of hæmorrhage has ceased,' Dr. Pozzi refers to Mr. Jennings's successful case in October 1885, before M. Richelot's first case in April 1886, but after M. Péan's first in June 1885, which was not published until April

1886, and concludes that, although M. Richelot has 'vulgarised' forcipressure in this operation, Mr. Jennings's case had been published nine months before M. Richelot made his communication to the Academy of Medicine.

But it matters very little who first proposed or first practised a particular method. The chief thing is to decide whether it should be followed or not, and my own belief is that it must be left to the choice of the surgeon in each case. He should be prepared to secure bleeding vessels by ligature or the forceps, as he finds he can do it more easily. Forceps with a variety of curves may prove more convenient than the straight instrument shown in the drawing. It may be that ligatures will do all that is required, and the best way of applying them that of Leopold, as shown in the drawing, each ligature passing twice through the peritoneum of Douglas's pouch and the vagina, and being tied so as to lie parallel to the line of incision—not simply bringing serous and mucous edges together, but compressing in separate portions the whole of the vaginal wall. I think the quickest way to do this would be to have a long ligature threaded at each end on a small needle, which would be passed by a needle-holder from the serous outward through the mucous membrane.

When these ligatures are tied they form a chain of compression all round the edges, and may be used afterwards by loosely tying some or all of the long ends together to close the opening from the vagina into the peritoneal cavity as far as may be desirable. By crossing their handles pressure forceps would have the same effect. My own feeling would be rather to trust

as a rule to forceps, and only exceptionally to ligatures. Forcippresure is simpler, more secure, takes much less time, and saves much suffering to the patient when sutures are removed. When an operator, who has prepared himself for the operation by sufficient practice on the dead body, trusts to forcippresure and has arranged everything before he begins, I feel sure that fifteen or twenty minutes would give ample time to complete the operation if the ovaries are not disturbed. If healthy, I think they had better be left alone, and so may the Fallopian tubes. But if the disease has extended high up the uterine cavity it would be safe to remove the tubes. And this would add very little to the duration of the operation.

I shall not attempt to give the results of this operation statistically; but it is important that we should know what a few of the most experienced operators have been able to accomplish. Professor Olshausen, of Berlin, formerly of Halle, who has had probably a larger experience of this operation than any other surgeon, informs me that the following table represents the whole of his experience of total extirpation of the uterus *per vaginam* for cancer:—

Years		Operations	Deaths
1881-82	{ (besides 5 incomplete operations, which all recovered)	22	8
From Jan. 1, 1883 to April 30, 1887	{ (no incomplete operation)	31	5
Total operations in Halle . . .		53	13
From May 1, 1887 to Nov. 5, 1888	{ " in Berlin . . .	99	13
Total . . .		152	26

The Professor adds: 'I very seldom perform supra-vaginal amputation, and only when the carcinoma is

limited to the *portio vaginalis*. Of my cases done in 1881-82, I have one who has remained free from recurrence for seven years, two others have been free for five and a half years, and one for five years. Professor Leopold wrote to me on the 11th of this month, stating that up to that date he had performed total extirpation of the uterus by the vagina in eighty-three cases with only five deaths, a mortality of six per cent. Péan, writing on the 13th, says that from 1882 to the end of 1887 he had done twenty-two operations, fifteen successful, and with seven deaths; but that this year he has had sixteen cases, all successful and no deaths. Martin, of Berlin, who had previously published sixty-six cases where cancer led to the operation, with eleven deaths or sixteen per cent. mortality, writes on the 16th of this month: 'Since the Washington Congress in 1887, I have performed the vaginal total operation in twenty-two instances.' (He does not say in how many for cancer.) 'All recovered but one, who died of hæmorrhage. Of supra-vaginal amputation I performed altogether six with one death.' It would be easy to collect a very large number of cases: such as Schroeder, fifty-nine with five per cent. mortality; Fritsch sixty, also seven per cent. But these do not bring us later than 1866, and they all tell the same story of greater success following larger experience.

As to the comparative mortality of infra- and supra-vaginal amputation and total excision, the results vary so much in successive years and in the practice of different operators that I have been unable to collect materials for a trustworthy contrast either as to the immediate fatality or as to the frequency of recurrence of disease. But it certainly appears that recurrence

is earlier after partial than after complete operations. In some series the remarkable fact comes out that supra-vaginal amputation stands the test of recurrence better than complete excision. This would be inexplicable if it were not for the probability that the disease had been generally much further advanced in the cases where total excision was performed than in the others.

Our American brethren have been before us in adopting the operation of total excision of the uterus, and, as elsewhere, their results have improved with time and experience.

The cases hitherto performed in this country have not been enough to serve for any comparison of results with those abroad, but they all teach the lesson that if the operation is to be successful it must be done early, before surrounding structures are involved in the disease. In addition to the case of Mr. Jennings, of which I have spoken, Dr. Purcell has had five successful cases; Dr. Sinclair, of Manchester, four; Mr. Reeves, Dr. W. Duncan, and Dr. Keith, one each; and I dare say other cases might be found by searching the medical journals of the last three or four years.

There are other parts of this subject on which I should like to say much more. I have alluded to Mr. Haviland's work on the geographical distribution of cancer, and now I can only point to these two of his maps which show how in certain districts of this country the mortality from cancer is high, and from phthisis low, and the exact reverse in other districts. I wished to allude to cancerous disease of the ovary, and to say how difficult it is to decide whether an ovarian tumour is innocent or malignant, even after



it has been removed and carefully examined. Now I can do no more than support the rule to operate early as the best way to avoid recurrence. I wished also to remind you how the mortality after amputation of the breast, and after removal of other parts affected by cancerous disease, has been so much lessened by modern sanitary science that all the old arguments against operating at all in cases of cancer require revision. I wished to say something about inadequate operations, and about operations which are unnecessarily severe—and much more than I did say against operating in hopeless cases, and in studying how to ‘soothe where we cannot save.’ Of cases which especially interest us, where cancer has affected the lips or tongue, the œsophagus, the larynx, the pylorus, the spleen or kidneys, the intestines, the bladder, and the female genital organs, I have not time to say another word. And now, in conclusion, I will only venture to express the belief that if some who have heard or who may read this lecture are convinced that cancer is increasing will try to find out the cause of the increase, and why cancerous diseases are so prevalent and so fatal; if they will also try to learn how to prevent or to cure them, no one can forecast the result. No one could have imagined that a forgotten book of Marco Polo would rouse the spirit of research in Columbus and lead to the discovery of a new continent, and no one can foretell what the work of one man may accomplish. It may be trifling, but—

Think nought a trifle, though it small appear ;  
 Small sands the mountain, moments make the year,  
 And trifles Life.

Each one may bring an offering, however small, to

the altar of one of the temples of Æsculapius—or, if his own search for knowledge fail, he may assist in preventing the failure of others, and in guiding them along the path to full success. And, year after year, the Morton Lecture may exert some influence for good upon all mankind in all coming generations.



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