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TWENTY-TWO YEARS' EXPERIENCE IN THE TREATMENT OF CANCEROUS AND OTHER TUMOURS

TWENTY-TWO YEARS' EXPERIENCE IN THE TREATMENT OF CANCEROUS AND OTHER TUMOURS.

WITH AN INTRODUCTION ON

The Increasing Prevalence of Cancer, and the Remedy for that Increase.

BY

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LONDON:
BAILLIÈRE, TINDALL AND COX,
20 & 21, KING WILLIAM STREET, STRAND.
[PARIS AND MADRID.]
1898.

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CANCEROUS AND OTHER TUMOURS

INTRODUCTION.

THE INCREASING PREVALENCE OF CANCER, AND THE TRUE REMEDY FOR THAT INCREASE.

CANCER is essentially a disease of civilization. It is almost unknown among savages. It is daily becoming more rife among all those races which are the nineteenth-century products of 'Social Evolution.'

Dr. Walshe, writing in 1846, remarks that the maximum amount occurs in Europe; that cancer is very rare among the natives of Egypt, Algiers, Senegal, Arabia, tropical America; is seldom seen in the hospitals of Hobart Town and Calcutta.

Dr. Young, in 1840, stated that mammary and uterine cancer were of very rare occurrence among negresses in the West Indies. 'Even those cases which I have witnessed in this class of people have been among the

better orders of them, whose habits of living have been assimilated to those of the Europeans' ('Anatomy of the Breast,' by Sir Astley Cooper).

Dr. Livingstone, 'Missionary Travels in South Africa, 1857,' remarks that cancer is quite unknown among the Bakwains.

Davidson's 'Geographical Pathology,' 1893, while showing the prevalence of cancer in Europe and the United States, affirms its rarity or entire absence in Arabia, East Central Africa, Bechuanaland, Faröe Isles, Gold Coast, Guiana, Iceland, Jamaica, Mauritius, New Caledonia, Persia, with a conflict of testimony in respect of Abyssinia.

On the other hand, the appended tables indicate the yearly increasing mortality in England and Wales, until 1895, the last return issued.

In Ireland the deaths from cancer in 1864 were 1,498, with a population of 5,675,307. In 1884, with a decrease of population to 4,962,693, is recorded an increased mortality of 1,947.

In Scotland, the population in 1864 was 3,118,701, with 1,300 victims from cancer. In 1884 the population was 4,962,693, the cancer mortality 2,110.

In New York the ratio of cancer deaths to the million persons living was in 1875, 400; in 1885, 530.

Now, every medical practitioner knows that the parts or organs which are most prone to cancer, and which furnish by far the larger proportion of the cases, are those which fall under the treatment of the operating surgeon.

All, again, who with adequate opportunity have studied malignant disease in the light of modern pathology, concur in recognising the perfect and permanent curability of cancer in such parts or organs, by the methods of truly scientific surgery, employed under certain conditions.

In the existing popular ignorance of cancer-science, those conditions are not attainable in every single instance; but in the great majority they assuredly are. And it is, therefore, obvious that this huge aggregate of yearly deaths signifies nothing less than imperfect acquaintance with technique by most of those who are entrusted with cancer operations.

It comparatively seldom occurs that the applicant at the Cancer Hospital has not been long previously treated, often by repeated surgical operations, elsewhere.

The subject is a peculiarly painful one from many points of view. If the fruits of long reflection thereon be here too plainly set forth, its importance to the public weal, the continually increasing proportions of the evil—above all, the power of the vested interests which bar improvement—must be pleaded in excuse.

One obstacle, of course, is furnished by the popular absence of elementary knowledge. Were the general laws of health, and therewith a pithy summary of those departures from natural law which prove the source of the more common diseases, made an integral part of every child's education, the community would materially benefit. That is a view which has, however, not invariably met with approval by the current organs of medical opinion.

The point is but a minor one. The principal impediments to progress lie in the medical profession itself.

With one exception, relating to a relatively limited class,* we have ample provision for the hospital treatment of cancer. For its scientific study there is practically none whatever.

The attempts of the Cancer Hospital authorities, by the institution of an annual course of lectures and by other means, to supply the deficiency have been largely negatived by the divorce of that institution with the other special hospitals from any recognised scheme of medical education.

The establishment of special hospitals for the treatment of particular branches of disease, and their marked success in popular esteem, has ultimately led to their being imitated by the differentiation of a corresponding department at each general hospital attached to a medical school. To this we note two conspicuous exceptions—Cancer and Tubercular Consumption. The average of success in dealing with these maladies remains, therefore, pretty much what it was thirty years ago.

* The class referred to is that of people whose condition involves offensive odours. Sometimes this is the unavoidable consequence of operations for cancer; sometimes it is the result of childbirth, or of other non-cancerous states. The sufferers are mostly women, and often perfectly healthy. They cannot be treated in a ward common to others, and are not relieved by any existing institution. The author has made several ineffectual attempts to found a special institution for their relief. No one can appreciate the suffering thus involved, except those who have actually witnessed it.

The delicate nature of the topic precludes allusion to it in the lay papers, and the poverty of the sufferers does not invite a medical crusade. Will no wealthy person come forward to fill a conspicuous gap among our charities?

From his first entrance on the curriculum, the student imbibes the notion that cancer is a perfectly simple affair, involving educationally little more than the identification of a few microscopic slides. Its pathology presents nothing worthy of exclusive study; its clinical features are easily grasped. For treatment drugs are useless. Surgical operations are little better, but must be resorted to as a matter of routine. Their results will be mostly unsatisfactory, as a matter of course. Any tyro is competent to perform them.

That is the gist of modern teaching, and of consequent medical public opinion. The fact is notorious. If proofs were needed, they may be found in the testimony of numerous witnesses before the House of Lords Commission on Hospitals.

The necessary consequences of such an educational tone are visible throughout the medical world in many other directions than the death records here in question. For years past, any pathological 'advance' has consisted rather in the multiplication of an already sufficiently obscure and complex terminology than in the establishment of Natural Law, or in any other form of real progress. Causation 'discoveries,' such as the innumerable 'parasites,' have been proclaimed, as a rule, in defiance of prohibitive general probabilities.

Any surgical 'improvement' has nearly always consisted in the performance of some heroic operation in startling contrast with the known course and phenomena of the disease. All the medicinal 'cures' have proved mares' nests. They have been, without exception, agents from which the faintest rational acquaintance with cancer-

science forbade all hope of benefit—generally an old and long-discredited substance or force.

Exactly as with cancer now, it was the custom thirty years ago to proclaim women's ailments peculiarly simple, and easily dealt with. Fortunately, that department fell into the hands of a powerful and able band of workers, with the results we all know.

Provision for the exclusive study of Gynæcology has been followed, within the brief period of twenty years, by the most marvellous progress in science and technique. Can anyone doubt that like results would follow application of the same principle to the extensive and very complex class of diseases popularly known as 'Cancer'?

Specialization, higher elaboration, ascent towards perfection by means of an ever-increasing restriction of function, is the first principle of civilization—nay, the corner-stone of Evolution itself. The history of life, so far as we now know it, is the record of portions of the frame set apart each for one particular purpose, until, from an almost formless mass of jelly, we arrive at the complex machinery of the human form.

So the history of civilization is but one of progressive Specialism, commencing with the aboriginal, who is his own 'Jack-of-all-trades,' and ending—— But we have hardly begun the journey, and who may yet talk of the end?

In every branch of human effort, the more limited the function, the better the performance, and the higher the resulting aggregate of gain to the community. When work and thought are in question, specialization is synonymous with concentration, with the bringing to bear on a single point the forces otherwise diffused over

a wide field. What holds good for Nature in the mass must likewise hold good for every part thereof. From a general law working everywhere else in the social edifice our narrow medical section can hardly, without ridicule, proclaim itself exempt.*

The more special branches in medicine, the more rapid its scientific improvement, the nearer to perfection its work. It is plainly to the interest of the general community to foster and develop by every means in their power a natural law of progress. But those medical practitioners also who may have learnt to look at things from a distant outside standpoint, and so to scan philosophically the signs of the times, can hardly avoid, I think, the conclusion which more intimately concerns themselves—viz., that the drift of this great movement makes for less laborious toil, smaller waste of force, better remuneration, enhanced repute and dignity for the profession itself.

Errors of detail, and even abuses, may exist, but these do not affect the principle. The habitual tone of the medical press on these matters, though of late considerably modified, is even yet much to be regretted. Still more unworthy of an educated class of men is that acrid depreciation of the special hospitals from which no reform movement in the medical world seems able to hold itself free.

By far the larger majority of cancer operations are now performed by men wholly unqualified, either by early

* In the United States, a rather singular process of differentiation is said to be taking place in an allied profession. The dentist who stops teeth does not extract them, and he who inserts new ones will not concern himself with either of the former.

education or by subsequent study, to undertake them. Such operations superficially appear, for the most part, simple and easy. That is particularly the case in the pre-infection stages, when a cure is possible; later on it does not so much matter. Only long dealing with these cases reveals the importance of the minute details, requiring to be varied or adjusted in each single instance, on which ultimate success depends.

Herein lies the secret of this daily increasing mortality, for which the attitude of the leading medical schools appears mainly responsible.

To the general neglect thereat of cancer-science must also be attributed the public distrust of orthodox doctors whenever 'cancer' is in question; disbelief in drugs, unless of the *omne ignotum pro magnifico* species; eager recourse to quacks. Straws are despairingly grasped at, while many long-authenticated means of benefit are utterly scouted.

Let the existing defects of medical education be remedied at their source, and we should hardly meet with such a debate as has just taken place on breast-cancer at the most august of London medical societies, the Royal Medico-Chirurgical. Throughout the four sittings occupied by the paper and discussion, the peculiar phenomena of Marrow-Infection, which was some years since shown to be the cardinal feature of that mysterious malady, elucidating the obscure points in its career, and vitally influencing its practical treatment, were not once referred to.

If I do not greatly err, this question of progress in cancer-science is intimately connected with the numerous other reforms for which the profession now more or less

blindly gropes, and which can hardly be effected without a Royal Commission of inquiry upon the entire working of the Medical Acts.*

Such are, first and foremost, the renovation of that peculiar mediæval anachronism, the College of Surgeons. 'Reform of the College of Surgeons is the practical question lying at the root of all the evils which afflict the profession' (Walter Rivington).

Secondly, among many lesser ills in an Augean stable may be mentioned the abuse of hospitals, especially of the powerful general hospitals with attached schools, which naturally attract patients from the non-necessitous classes, and which are strong enough to suppress or divert attempts at amendment. The employment of parts thereof as paying homes, to the detriment not only of doctors, but of that struggling and meritorious band of nurses who keep private hospitals; the Medical Aid Society question; the constitution of the Medical Council, involving the concentration of all power in the hands of corporations, to the exclusion of the profession at large—have also much to do with the existing 'down-grade.' A comparison of the average value of practices advertised for sale twenty years ago with the prices now current will afford a rough gauge of the enormous depreciation which has taken place in that period.

I conceive that all these departures from health fundamentally spring from a similar source to this progressive cancer mortality—viz., from the overweening supremacy, social, legislative, even scientific, of narrow oligarchic bodies, in many respects behind the times.

* See also note, p. 46.

The fundamental vice of modern Medicine appears to be an utter disuse of the Deductive Method. Induction reigns supreme over medical thought. Thus, one of the most fruitful paths of discovery remains untrodden. Thus, also, medical literature is pervaded by an overweening reverence for German statistics and opinions—highly valuable in virtue of their laborious industry; most dangerous when on a wrong tack, by reason of the ponderous figures with which they usually deal, bearing down all contradiction by sheer weight of numbers.

However this may be, I respectfully submit that the yearly increasing ravages of cancer, as indicated by the appended returns, constitute an extraordinary danger, demanding extraordinary measures for their curtailment or suppression; that the community should hardly, as now, meet the trouble passively with folded hands; that action by the State is imperatively indicated.*

Trusting that my own humble experiences may be not wholly without value in grappling with the evil, I have endeavoured briefly to set forth the more salient and practical points learnt since 1876, when I was honoured by an appointment on the staff of the Cancer Hospital. For the further elucidation of any that may seem controversial, and cannot be fully dealt with here, readers will kindly consult the more elaborate *Treatise*.

6, GLOUCESTER PLACE, PORTMAN SQUARE,
April, 1898.

* This of course may be supplemented by private munificence wisely seeking to promote scientific research and technical education, no less than popular enlightenment. The 'Morton Lectures on Cancer,' now discontinued, can hardly be held a success in either direction.

I.

Thirty-two Years' Aggregate Mortality from Cancer in England and Wales.

(*From the returns of the Registrar-General.*)

Year.	Males.	Females.	Total deaths.
1864	2,459	5,658	8,117
1865	2,389	5,533	7,922
1866	2,532	5,761	8,293
1867	2,650	5,895	8,545
1868	2,743	6,137	8,880
1869	2,933	6,381	9,314
1870	2,971	6,627	9,598
1871	3,060	6,631	9,691
1872	3,228	6,765	9,993
1873	3,387	7,118	10,505
1874	3,470	7,541	11,011
1875	3,648	7,766	11,414
1876	3,747	7,852	11,599
1877	3,988	8,134	12,122
1878	4,207	8,457	12,664
1879	4,183	8,616	12,799
1880	4,461	8,817	13,278
1881	4,611	8,931	13,542
1882	4,685	9,372	14,057
1883	4,967	9,647	14,614
1884	5,346	9,852	15,198
1885	5,195	10,065	15,260
1886	5,754	10,489	16,243
1887	6,262	10,851	17,113
1888	6,284	11,222	17,506
1889	6,891	11,763	18,654
1890	7,137	12,296	19,433
1891	7,294	12,823	20,117
1892	7,547	12,806	20,353
1893	7,908	13,227	21,135
1894	8,077	13,345	21,422
1895	8,268	14,317	22,945

II.

RATIO OF ANNUAL DEATHS FROM CANCER TO EACH MILLION OF PERSONS LIVING.

Year.	Ratio.	Year.	Ratio.
1864	385	1880	512
1865	372	1881	520
1866	385	1882	534
1867	392	1883	549
1868	401	1884	563
1869	417	1885	572
1870	424	1886	590
1871	423	1887	615
1872	429	1888	631
1873	444	1889	656
1874	461	1890	676
1875	471	1891	692
1876	471	1892	690
1877	488	1893	711
1878	503	1894	713
1879	501	1895	755

CHAPTER I.

THE CANCER PROCESS.

BEFORE answering the question, 'What is cancer?' it may be well to consider what cancer is not.

Inclusion Theory of Cohnheim.

Cohnheim attributed malignancy to embryonic residua or 'nests.' Cells or cell-clusters in the fœtus, which should normally have become developed into one or other of the natural tissues, fail to undergo that transformation, and continue to exist as cells throughout childhood into adult life. Under the influence of some unknown stimulus, these suddenly increase and multiply, giving birth to a mass of new cells. Thus all the phenomena of cancer.

To this hypothesis there are two overwhelming objections:

1. Cancer most prevails in organs or tissues wherein no embryonic residua can be detected by the microscope or otherwise, and in which it is impossible to believe that such commonly exist, *e.g.*, the mamma and uterus of women, the buccal mucous membrane of men.

2. In face of clinical experience and of copious statistic research by many modern authors, it is impossible to

ascribe ordinary cancerous disease to any element of heredity in the progenitors of the individual.

A third and hardly less cogent reason is the vital argument against Heredity in any shape. No cancer ever arises without an obvious exciting cause, whether there have been cancerous ancestors or not.

The average 'cancer' of the adult is here alluded to, and the above applies to some 98 per cent. of the gross total.

Congenital Cancers (Blastomata).

Cohnheim's hypothesis has perfect validity, however, for the small remainder, about 2 per cent. In reference to these it is a true theory, accounting for most of the phenomena, and resting on ample evidence. No work on the whole field of malignant diseases can omit the description of an anomalous minority of cancers which are not amenable to the ordinary laws of causation, of structure, or of development, and which cannot be included in any of the recognised classes.

On these really congenital cancers I have ventured to confer the title *blastoma*, from βλαστος, germ. In them the presence of unobliterated fœtal remnants, or groups of embryonic cells, is susceptible of microscopic or macroscopic proof. For a complete notice of the group, with cases, the student will consult Appendix A in 'Cancers and the Cancer Process.'

It is sufficient now to remark that the development of Blastomata differs from that of ordinary cancer in the non-necessity of an exciting cause. The tumours often seem to grow spontaneously.

Secondly, that their structure is widely different, and *sui generis*. The most typical examples show a strange mixture of heterogeneous tissues, cysts, tubules, gland-acini, cartilage, fat, bone, even nerve and muscle; carcinoma cells with those of sarcoma, cylindroma tubules with both, etc.

Thirdly, that while not sufficiently numerous appreciably to affect the statistics of cancer, and so hardly falling within the scope of this work, yet a philosophic study of this remarkable group can in nowise be neglected by any scientific investigator of cancer phenomena and their laws.

Lastly, the course of the Blastomata affords material support to the Autositic Theory of ordinary cancer.

Pangenesis.

It is often forgotten that the greatest naturalist who has ever lived did not put forward the suggestion which passes under the above title as a serious theory at all; yet it derives factitious importance from his fame.

Darwin's special desideratum was 'a good working hypothesis.' As such, and no more, was pangenesis indicated in explanation of cancer development.

This 'working hypothesis' must be the ordinary prelude to a true theory; the former, of course, is but a supposition, or guess. A theory tallies with some at least of the known facts or phenomena.

The coining of rational hypotheses and their subsequent erection into theories is the essence of the Deductive Method of ratiocination. It is the neglect of this method which so seriously trammels all modern medical sciences.

Darwin supposed that every cell-constituent of the body, not too highly differentiated, emits gemmules, which retain the characteristic qualities of the parent cell. These gemmules become concentrated in the elements of reproduction, thence passing to the offspring, who thus inherit the peculiarities immediate and remote of their progenitors. Thus, the cancerous parent is believed to hand on the same disease potentially to the descendants.

While the existence of these infinitely minute gemmules is absolutely hypothetical, the general view is negatived by the same powerful *a priori* objection to Cohnheim's: that no appreciable value in cancer causation can be ascribed to hereditary predisposition.

Dr. Creighton's Views.*

The various tumours of the Mamma, which organ is alone referred to, were ascribed to varying degrees of secretory force, affecting the normal processes of evolution. A feeble force or stimulus was supposed to generate carcinoma; a stronger one, sarcoma; a still stronger, myxoma or enchondroma, and so on. These papers now hardly possess more than an antiquarian interest. While failing to retain credence by reason of their nebulosity, peculiar microscopic delineations, and incompatibility with clinical phenomena, they yet contain a certain germ of truth in their appreciation of the fact that in the female breast cancer is but one of several phases of aberration in a natural process.

* 'Reports of Medical Officer to Privy Council,' new series, VI.

The Microbe Theory.

Bacteriology has effected most valuable discoveries of natural law, most important new departures in treatment. It is therefore a Fashion, and one now predominant. Like most other fashions, it is prone to be carried to conspicuous excess.

Innumerable painstaking investigators have thus sought to bring cancer into line with such maladies as Leprosy and Tubercle, with which it has no natural affinity.

A very large number of reputed cancer parasites have been described. It has hitherto proved impossible to demonstrate that the microscopic appearances so styled are organisms at all, much less that they bear any causal relation to malignant lesions.

Moreover, there is a very remarkable contrast between the phenomena of diseases, such as leprosy and tuberculosis, in which a microbic origin has been shown, and those of cancer. Thus, strong *a priori* grounds exist for regarding the causation of the latter as entirely different.

Maladies proved due to a micro-parasite were, long before the actual demonstration of its presence, characterized by one of two features: either there was strong presumption of a contagious element, or else a number of individuals exposed to like conditions of climate or soil were similarly, and more or less simultaneously, affected.

The contagious nature of Tuberculosis was always suspected, though displayed among long-acclimatized races rather fitfully. It was conspicuously shown when the microbe gained access to a fresh soil, as when native tribes

in various parts of the world dwindled away before the whites. Other causes were to a certain extent in question, but this was the chief.* On leprosy, nothing need be said.

In Malarious Fevers there is no propagation by contact or vicinity, but numerous persons under a particular climatic environment suffer more or less simultaneously.

We find nothing in cancer even remotely resembling either of these classes. There is never the least suspicion of propagation by actual contact, much less by proximity.

No husband ever contracts the disease from his wife, or *vice versâ*. I have, indeed, met with some five or six instances of both falling successively a prey to malignant disease ; but the relative organs were different, the variety was distinct ; there was a wide interval of time, always a special cause, and all the circumstances such that no transmission from one to the other could be thought of for a moment.

The experimental inoculation of cancer from one animal to another, with every precaution to ensure success, is a task of the utmost difficulty. Even the few rare instances in which this has been accomplished are regarded by their authors as transplantation of tissue, not of disease germs.†

No considerable number of individuals are attacked by carcinoma, or by other prevalent species of cancer, in any single place, within a moderate time-limit.‡

No variety of cancer bears any demonstrable, or even plausible, relation to climate or soil. It has been attempted

* De Quatrefages, 'The Human Race.'

† Hanau, Medical Congress, Rome, 1894.

‡ See report of the wide collective investigation by a committee of the British Medical Association, *Journal*, February 26, 1887.

to show that there is excessive cancer mortality in towns 'situated on rivers which periodically overflow their banks.' Thus dampness of soil, favourable to microbes, is supposed to promote the development of cancer.

On investigation, preponderance of cancer-deaths in such places proves more plausibly explicable by the presence of a large infirmary, attracting patients from a wide area around. Any special frequency of malignant complaints passes wholly unrecognised by the local practitioners.*

Shrewsbury may serve as an apt example of this kind of reasoning. It is on a river which has occasional floods. The statistics show a large cancer mortality.

Per contra, the resident medical men know of no special proclivity among the inhabitants to cancer. There is an extensive infirmary, crowded by patients, not only from Shropshire, but from all Mid and South Wales. Nine-tenths of the houses are on eminences, high and dry. On the most liberal computation, barely a tenth can possibly be affected by the biggest inundation of the Severn.

In relation to disease, no statistical argument has validity unless founded on a solid basis of clinical experience, and of *a priori* general probability.

It has lately become rather the fashion to describe 'cancer houses,' in which several persons have successively fallen victims. All the instances hitherto recorded have been reported in the most vague and unsatisfactory manner. They deal with widely diverse species of malignant growth, of dubious authenticity, and often on hearsay evidence.

* *Lancet*, November 22, 1890.

There is no indication that the inhabitants of hot climates are more liable than those of cold, of moist regions than of dry, of high and elevated than of low-lying valleys, etc.

The argument which renders a microbic source of cancer so improbable as to be well-nigh impossible is furnished by the microscope.

Every cancerous growth is a copy—morbid, but nevertheless a copy—of the healthy tissue from which it springs. Carcinoma of the breast exactly mimics the alveolar or acinar structure of the natural organ. Intestinal cancer is a pathological reproduction of Lieberkühn's follicles, tubules lined by columnar epithelium. Melanotic cancers, of both species, are always pervaded by the special pigment. And so throughout.

Not only is the Primary, the starting-point of the mischief, thus distinguished; but also every secondary deposit in the remotest parts of the body, sometimes to the number of several hundreds. Each presents in minutest structural detail the close resemblance of child and parent.

This strikingly contrasts with what takes place in all new growths of the parasitic order. An animal or vegetable germ implanted in the tissues sets up a local proliferation of the cell elements and a tumour at the spot, as with the fungus of actinomycosis in man or cattle, the gall-nut and its congeners in the vegetable kingdom.

It is difficult, if not impossible, to conceive that any extraneous agent, such as a micro-parasite, could effect

that heterogeneous transplantation of dissimilar tissues—a morsel of the breast, for example, grafted upon, or in, the liver; a piece of intestine or stomach on the lungs—which is the mark of Cancer in all its forms.

The Autositic Theory.

The human body is wholly composed of cells, pure and simple; of modified cells; and of products formed within cells. Its complex machinery has been built up from a single cell as the starting-point.

The Amœba is a tiny animal which maintains an independent existence, and yet consists of but a solitary cell. It is composed of a jelly-like substance, entitled protoplasm, anent whose properties we practically know nothing. If we did, we should go far towards solving the mystery of life. A small portion of this protoplasm, the *nucleus*, is differentiated from the rest. It has higher vital and different chemical properties, and acts as a governing centre to the whole. Some individuals, but not all, have a further differentiation of *ecto-sarc* and *endo-sarc*—that is, of cell-wall more compact, and of cell-contents more fluid.

The amœba exhibits on a microscopic scale all the phenomena shown by the largest member of the animal kingdom. It takes food into its substance, digests it, excretes the useless portions. It moves about by contracting and extending its body, these motions responding to excitation from without, and to impulse from within. It reproduces by fissiparous division, commencing as a rule in the nucleus. Lastly, it may be said to breathe, the metabolic processes which nourish it being largely processes of oxidation.

All cells are fundamentally constructed upon the same ground-plan as the amœba; and all through some part of their existence are practically distinct organisms, moving in the same way, and leading a quasi-independent life. The leucocytes of the blood are from beginning to end no more than amœbæ.

The whole body is evolved from clusters of amœboid cells. Many of these primordial organisms are, of course, eventually developed into the various tissues: nerve, muscle, cartilage, bone, etc.; but many never pass beyond the primary universal stage of cell-life. It is among these or their descendants that cancer almost always arises.

Organization of the cell-clusters into formed tissue takes place under the control of the nerve centres, and by means of some regulating mechanism inherent in the latter.

Emancipation from the presiding authority of the central nervous system during the period of development involves structural aberration, such as the various deformities or 'freaks.'

Weakness or derangement of the central power after the organism has reached maturity results first in disordered function, *i.e.*, in ill-health; secondly, and generally after some continuance of the former stage, in organic morbid changes, *i.e.*, in disease. It is hardly too much to say that all maladies not directly induced by extraneous agency are primarily nerve derangements.

The Autositic Theory ascribes cancer to a reversion of the natural cells or cell elements to that primitive amœbi-

form condition from which all have emerged, and in which a few still persist. Each cell then casts off its allegiance to the nerve centres, which cease to exert over it the least control. It becomes a quasi-independent parasite, or rather Autosite.

The malignant or 'cancer'-cell now preys, exactly as a parasite would, upon the healthy parts around, devouring these, and appropriating the nutriment destined for them. Its life is not as their life, and involves sooner or later their death. Ultimately it brings about the somatic death of the whole organism.

A runaway horse furnishes an apt, if homely, exemplar of cancerous disease, as conceived by the autositic theory.

The numerous species of cancer depend on the particular kind of cell subjected to this morbid reversion, the cancer process.

In favour of that theory, much positive evidence can be found. Even were there none, it would still fulfil, as no other yet advanced has done, the desideratum, without which Darwin regarded scientific progress as well-nigh impossible—a good working hypothesis.

With the microscope, the individual cells of any cancerous growth can be distinctly seen to erode the parts with which they come in contact. Clinically, the new growth unmistakably nourishes itself at the expense of the surrounding tissues in the first instance; remotely, at the cost of the whole body. Transported to distant regions of the organism, the same happens.

Some palpable derangement or perturbation of the central nervous system is the all but invariable precursor

of the most prevalent forms of cancer. Those not owning such an exciting cause are immediately preceded by conditions interfering with local nutrition, such as chronic inflammation or congestion.

Exactly as age advances, and as the nerve centres descend the grade of vitality, do we find progressively increased liability to malignant disease.*

Those organs which show the most intimate correlation with emotional states contribute by far the larger majority of cancer cases.

The female, the more emotional sex, is vastly more prone to cancer than the male. The special liability of women in this direction would be much more conspicuous were it not to a certain extent counterbalanced by pernicious habits of life in men.†

Often a cancer-development dates directly from a sudden shock, fright, attack of paralysis, or of influenza.

* Scant reliance can be placed on age-statistics in cancer, unless very broadly regarded—*i.e.*, merely as indicating general drift or tendency. This for the following reasons : (*a*) Numerous old persons die from unrecognised cancer of internal organs, their deaths being medically certified as due to 'inflammation of the bowels,' 'gastritis,' 'enteritis,' 'senile decay,' etc. (*b*) The very old are less exposed to injuries than those who labour with their hands. (*c*) The special organs of the female which are so enormously prone to cancer in the middle period have, in extreme old age, become obsolete, and practically extinct.

† As indicating the fallacy of death statistics, and also the loose manner in which statements based thereon are handed down, Dr. Walshe in 1846 mentioned the stomach as more prone to cancer than any other organ. In the mortality records of Paris, he found 2,303 deaths from this source, against 2,966 from uterine and 1,147 from mammary cancer. That assertion is widely at variance with English experience, yet is still occasionally quoted as authoritative.

The most predominant of all cancer-factors is mental distress, anxiety, trouble. In the mamma it is found that even the cancers supposed to be caused by a blow have generally been associated with much preceding emotional disturbance, worry, and loss of sleep.

Other testimony is furnished by the tendency of many Benign Tumours to become cancerous as age advances, and as the energy of the nerve centres decreases. Thus, mammary cysts, though in themselves innocuous, can never be safely neglected. In the long-run, it may not be for twenty years, though as a rule far sooner, they develop truly malignant characters in one form or another.

The same holds good to a more limited extent with uterine Myomata, the familiar fibroids. Some eventually pass into Myo-sarcoma (for examples see *Treatise*). And though many assuredly do not, even in extreme old age; it is yet likely that with more careful observation at women's hospitals (where pathology, as a rule, is not a strong point) the sequence will prove far less rare than is now held.

Such tumours as Enchondroma often after removal display histological transition from healthy cartilage or fibrous tissue at one end to true Spindle-sarcoma at the other. Their clinical history exactly corresponds to the revelations of the microscope. After some years of growth as 'Benign,' they assume a truly malignant stage. Examples of the same sequence under less common circumstances, as in fat or bone, are quoted in the work cited.

Though familiarity has blunted the force of this example, the sequence of Epithelioma on an old-standing wart is an apt instance of the same reversion process, of a truly benign new-growth merging into one as truly cancerous.

Wherever in the body cell-proliferation is specially active, we look for cancer, viz., the mammæ and uterus, glands and epithelium of the digestive tract, periosteal covering of the bones, hair follicles of the eyelid.

The spontaneous development of many Blastomata has been referred to as an argument supporting the autositic theory.

That generalization is the only one which proffers plausible explanation of all the varied phenomena of every species of cancer.

Cancer is in no sense of the word a 'constitutional' disease.

The only drugs which arrest its career are 'neurotics' having a special influence on the cerebral nerve centres.

CHAPTER II.

CLASSIFICATION.

EACH specialized variety of cell in the healthy body furnishes its own species of cancer.

Each invariably breeds true, *i.e.*, reproduces its own kind, and no other.

Only one cell species is concerned at a time. There are no mixed forms of cancer except among the rare Blastomata.

The ordinary cancer begins in a single group of cells; it may be in a single cell.

The common attributes of cancer, whatever the species, are:

1. Progressive erosion.
2. Auto-infection.
3. Progressive tendency to death.

The new cells progressively erode or devour the healthy tissues with which they come in contact. They, or broken-off fragments of their nuclei, are mechanically transplanted to more or less distant parts, where they freely grow and form new colonies. The sum of these, and of various other phenomena, is 'a progressive tendency towards the death of the individual.'

These attributes are shown by the different species, and even by different local forms of the same species, in very varying degrees.

About the obscure groups marked in the following table with a note of interrogation hardly anything is certainly known.

CANCER OR MALIGNANT DISEASE.

I. NON-CONGENITAL.	II. CONGENITAL.
The ordinary 'cancer,' comprising about 95 per cent. of all cases of malignant disease. Is always generated by a definite exciting cause.	Blastoma, from βλαστός, germ. Often, though not always, spontaneous, and owning no extraneous excitant. Rare and exceptional in most of its forms, which have been described under various names: rhabdo-myoma, oöphoroma, dermoids, tumours of the soft palate, parotid myxo-chondroma, retinal glioma, renal sarcoma, etc.

Ordinary non-congenital cancer presents 9 primary varieties or genera:

I. Epithelioma, or epithelial cancer—The cancer of skin or mucous membrane.
II. Carcinoma—The cancer of secreting glands.
III. Sarcoma—The cancer of the connective tissues.
IV. Lympho-carcinoma — The cancer of the lymph glands and lymphoid or adenoid tissues, including the marrow.
V. Cylindroma—The cancer of gastric and intestinal gland tubules.
VI. Rodent ulcer—The cancer of short hair follicles.

VII. Glioma—The cancer of nerve tissue (?).
VIII. Myo-sarcoma—The cancer of non-striped muscle.
IX. Endothelioma — The cancer of serous membranes (?).

From these *genera* sub-varieties or *species* arise by modifications in structural details, sometimes degenerative, sometimes in the direction of higher organization.

Scirrhus is the common hard cancer of the female breast. The most chronic forms, attacking ill-developed or withered organs, are termed 'atrophic.'

Encephaloid is the acute variety of the preceding. The difference is only one of degree.

Spindle-Sarcoma is the ordinary cancer of the connective tissues. All true sarcomata are more or less spindle-celled.

Mixed-celled Sarcoma is an acute form of the preceding, in which a certain proportion of the cells fail to assume the fusiform shape.

Osteoid Sarcoma is a variant of the same, in which the spindle-celled base undergoes elaboration into imperfect bone.

Myxoma is another variant, wherein some of the fusiform cells degenerate into a fluid resembling mucus.

In **Chloroma**—a very rare form, which I have never seen, and of which no example, so far as I know, has been recorded for many years—a periosteal sarcoma of the skull assumes a greenish coloration.

Alveolar Sarcoma is a term supposed to denote an alveolar or pouch-like stroma, containing malignant cells

of connective-tissue origin. The term is vague and the fact doubtful.

Melanotic Sarcoma is a spindle-sarcoma arising from pigmented connective tissue, so blackish or brown.

Myeloid Sarcoma is merely an ordinary spindle-celled sarcoma, containing the multinucleated corpuscles known as giant-cells or myeloids. It is not a true species, or even variety.

Melanotic Epithelial Cancer arises in the Malpighian layer of the skin. The deposits are therefore brown or blackish.

Colloid Cancer is sometimes a carcinoma, sometimes cylindroma. A peculiar gelatinous material is found in conjunction with the structures proper to these.

Intracystic Cancerous Growths may be either sarcomatous or carcinomatous, according as they spring from the connective tissue of the cyst wall or from included glandular cells. Some have been erroneously described as 'duct cancer.'

Sundry rare and obscure maladies demand a passing notice, though on judicious revision some would probably disappear from the record.

Cheloid, or **Keloid**, denotes a thick overgrown scar, in no way malignant. It was formerly common among soldiers after flogging, and may follow any badly-treated open sore. I have seen a characteristic case after multiple skin-grafts for a breast-cancer operation.

Cheloid occasionally becomes associated with Epithelioma, attacking the adjacent skin. Of this nature were

the warty growths of cicatrices described by Cæsar Hawkins, and sometimes quoted as examples of the above. The 'plexiform sarcoma' of Billroth is believed to be an endothelioma.

Kaposi's Disease (**Xeroderma Pigmentosum**) appears to be an epithelioma of the skin appearing in children upon multiple nævoid tufts.

Dühring's Neoplasm (**Granuloma Fungoides**) is considered to be a sarcoma of the skin following long-continued eczema. Neither of these appears to be known in England.

Thyroid Cancer is a very rare form, arising in the thyroid body, and producing metastases of thyroid tissue.

Psammomata are small tumours in the membranes of the brain or spinal cord, containing calcareous particles. They are not cancerous in any way, though for some mysterious reason always described in text-books among the cancer class.

The very extensive group of maladies passing under the generic term 'cancer' are thus highly complex, and many members thereof extremely obscure.

Some Gliomata are ascribed to the neuroglia, others, on the authority of Virchow, may be assigned to the nerve cells themselves, while many are of embryonic source. The staple character of Endothelium is adverse to the theory of malignancy therein.

In articles on 'Cancer' all the less prevalent malignant diseases are habitually disregarded. With few

exceptions, the phenomena of mammary carcinoma are alone considered and discussed under the title. That narrow attitude is eminently unscientific and the source of abundant error. It is impossible to reason on the laws or phenomena of a single local lesion without regard to the rest.

Cancer-research is rendered additionally difficult by the confused nomenclature in vogue. Numerous technical words are used in varying, or even contradictory, senses, without attempt at definition. 'Alveolar sarcoma' has at least three meanings. 'Carcinoma' covers epitheliomata and cylindromata, as well as its own proper lesion. 'Rodent ulcer,' as the last discussion at the Pathological Society showed, is used by even pathologists in the vaguest possible manner.

So on throughout the whole group. The first *sine quâ non* of progress is a precise and accurately defined terminology. No advance in cancer-science can possibly take place till this urgently needed reform is instituted.

The current vagueness of diction, and consequent confusion of ideas, are enhanced by a conspicuous absence in medical literature of the generalizing faculty, as well as by a pronounced inclination to multiply fine distinctions which involve no real difference. Thus the obscurity daily increases.

All the laws of Nature ultimately prove capable of the simplest expression. Those of disease, properly comprehended and rationally taught, could hardly furnish an exception to this universal rule.

There can be no scientific Surgery without a rational foundation in Pathology. To the existing practical divorce between the two branches, to the confused state of the latter, to the defective way in which it is usually taught, to the ultra-conservative instincts of the societies devoted to its culture, must be ascribed a large share in the progressive increase of cancer-mortality.

CHAPTER III.

CAUSATION.

ORDINARY cancer, non-congenital, is alone here referred to, and of this the rarer species mentioned but incidentally.

Cancer is a disease of Civilization, almost restricted to the civilized state. The species contributing most to the mortality statistics are those directly associated with the increased worry, trouble, and anxiety which modern civilization brings in its train.

The organs which principally suffer are peculiarly dependent on the emotions, and woman, possessing those organs, is therefore the principal victim.

In women the causation by trouble is mostly direct and primary. In men it is largely, though not entirely, secondary and indirect.

In the male, the less emotional sex, direct excitation by anxiety and sorrow is evinced by the relatively infrequent visceral cancers of the old. The more common Epitheliomata of mucous membranes generally follow upon that resort to alcohol which is the bane of civilized man.

The rich are relatively exempt from ordinary (factitious) cancer.

As each tissue generates its special cancer, and as the cancer process appears to be a reversion of the cell-elements therein to a primitive embryonic stage, it follows, almost of necessity, that the different kinds of cell respond to different stimuli applied in varying modes. In other words, that the various cancer-species are generated by widely diverse causes.

Every cancer development is traceable to a direct exciting cause as the immediate precursor, whether there be a suspicion of heredity or not.

We have no reason to consider an individual with 'cancer in the family' more prone to malignant disease than one otherwise circumstanced.

Cancer in any form is rare among the lower animals. When seen, it is usually epithelioma, of mechanical origin. Dogs, which lead more pampered lives than other domestic animals, are the most liable.

I. Epithelioma, or Epithelial Cancer.

This, the special cancer of skin or mucous membrane, is invariably generated by direct irritation of epidermic or epithelial cells, continued for a certain time—in short, by *continued friction*.

Upon mucous surfaces there is usually an antecedent sore or crack, due to some trivial accident, and not induced to heal. Exceptionally a wart or papilloma precedes.

Upon the skin the antecedent wart is the rule, and not merely an exception. There must also have been continued friction, with probably a minute breach of surface.

A common site is the junction of mucous membrane and skin, as on the prolabium and at the commissure of the lips. This because the part is liable to crack, and to be subsequently prevented by various agencies from undergoing repair. The same remark applies to old cicatrices on the skin.

The tongue and mucous membrane of the mouth generally are prone to attack by epithelioma: first, because that membrane in disordered health from any source becomes congested and morbid; secondly, because any casual breach of surface is commonly prevented from union by friction against prominent teeth or teeth-stumps, as also by the habit of smoking.

Anything producing a habitually furred or congested mucous membrane tends to generate epithelioma.

The three most prominent factors in this result are: Alcoholism, Smoking, Remote Syphilis. They are aided by neglect of cleanliness.

With smokers, an additional mechanical irritant is the contact of a heated pipe or cigar-holder with any casual fissure. Failing the latter, the habit can be indulged without fear.

Any individual whose tongue has suffered from syphilis needs special vigilance over the organ for the remainder of his life. That disease leaves behind it a cicatricial condition of the surface, liable to ulcerate at the least provocation; with this may be warty growths, or, earlier in life, gummatous tumours. In addition, the power of

repair in the whole system is lessened, so that casual breaches of surface are slow to heal, and, when once cicatrized, apt to ulcerate again and again.

Epithelioma of Lips, Tongue, Mouth, Throat is *par excellence* the special cancer of the male sex. This because men, those of the labouring classes in particular, habitually expose themselves to the excitants above mentioned; whereas, on the other hand, women as a rule clean their teeth, don't drink, and don't smoke. Of 103 examples, 80 patients were male, 23 female; but the real preponderance of the former is much larger.

At the same time, cleanliness and healthy living are not everything, and innumerable lives would have been saved by a timely visit to the dentist. A sharp projecting point or edge against which the tongue rubs continuously will soon bring on cancerous ulceration in even the healthiest mouth. And the tooth which establishes this prominence may be perfectly healthy, though as a rule otherwise.

Young people do not suffer, because vitality is relatively sound, repair of injury is prompt and sure, personal cleanliness duly sought.

Old age tends to epithelial cancer here by lessening power of repair, by tooth decay, by frequent congestion under improper diet, by altered form of the lower jaw, and by habits of neglect.

Chimney-sweep's cancer of the scrotum, due to lodgment of soot in the folds of the dartos, is now rare, on account of greater cleanliness. The sweeps of Belgium, Holland, North Germany, and Switzerland, who wash

themselves daily from head to foot, besides taking dress precautions, are quite immune.

Soot specially irritates the epidermis, rendering the entire skin of the sweep harsh and dry. Other carbon compounds, petroleum, coal-tar, bisulphide of carbon, have the same effect. I have seen a soot cancer on the hand of a gardener, who had used that substance for manure.

A local wart or sore is always the first step. The removal of this a year or more previously to the development of gland-infection has led to the fallacy that the inguinal glands may be attacked primarily.

Epitheliomata are the most easily preventible of all cancerous growths, and are hardly ever met with except as the obvious result of personal neglect.

II. Carcinoma—The Cancer of Secreting Glands

—is the prevalent cancer of the female, as epithelioma of the male.

Articles on cancer in the lay press, with many also in the medical journals, refer almost exclusively to carcinoma of the female breast. The phenomena of mammary cancer, in many respects mysterious until recent years, have deeply tinged popular and medical ideas of malignant disease in general.

In any scientific investigation it is essential to disabuse the mind of this prepossession. However numerically prevalent, breast-cancer is but one among many kinds; is not even a distinct species; presents important differ-

ences in phenomena from even the same species attacking other organs ; is in no way typical of the class.

Carcinomata own two modes of causation—the neurotic and the mechanical. They may also secondarily supervene on certain benign tumours.

Mental distress, worry, anxiety, form the immediate excitant in about 90 per cent.

In the remainder, sudden violence, a fall, or blow precedes. Somewhat rarely, *e.g.*, about the nipple, the cause is continued friction, as in the preceding species.

Even when there has been actual injury, it is commonly found, when women are the sufferers, that there has been simultaneous grave trouble—a 'skeleton in the closet.'

The neurotic mode of causation is best studied in the Mamma, and in association with the Benign Tumour formations of that organ (see Chapter XVII.).

The delicate dependence of the mammary functions on emotion becomes evident during lactation. Sir Astley Cooper states that terror entirely stops the secretion of milk. Grief lessens its quantity, as do also anxiety and fear. A fretful temper makes the milk unwholesome and irritating. Anger produces green evacuations in the infant. The nursling has been known to die of convulsions after a violent passion in the mother.

The quantitative variations may depend on blood-supply. The qualitative must follow modifications in the cells themselves.

The Uterus passes through three stages of development parallel to those of the mamma, with also a monthly

cycle of cell-changes. Carcinoma rarely attacks either organ until the period of permanent decadence.

The uterine functions are even more obviously dependent on cerebral control than the mammary. The gross lesions of the devolution period—cancer only one of these—are no less common and conspicuous.

Mental distress is the most common and prominent.

Other depressing factors have the same effect. I have encountered numerous cancer-cases directly following influenza.

Paralysis, fever, any source of continued ill-health, is apt to terminate in carcinoma.

Deprivation of sleep from any cause is a source of carcinoma; the same with laborious and exhausting physical toil. Thus laundresses are peculiarly liable above any other class of women known to me, to both mammary and uterine cancer.

In males, whose visceral gland-organs are the seats of carcinoma, the outbreak of malignant disease is found to be immediately preceded by money or business troubles, death of relatives, misconduct of children, and the like.

The second mode of causation is, of course, directly applied to the gland-cells themselves. Mechanical violence, a blow or fall, is followed after a few weeks by cancer developments. Presumably, some internal rupture of the acini takes place, the cells being displaced, and their nerve-supply thrown out of gear.

According to statistics, 11·5 per cent. of mammary carcinomata follow a blow or fall, and are statistically recorded as due to injury.

That may be sometimes a valid cause. Nearly always, however, concealed sources of trouble—a drunken husband, or the like—become apparent on further inquiry.

In rare cases, cancers of the mamma appear to exemplify nerve-causation in another way. Anything irritating the nipple—such as an ill-fitting corset—may be followed by a carcinoma deep within the organ, and remote from the spot.

Much more often ulceration, or other irritative condition of the nipple, passes directly into scirrhus at the site.

Apparently by mechanical hindrance to the natural devolution do cysts and solid mammary tumours of the third period result in malignant disease.

In men, breast carcinoma is the sequel of mechanical violence only.

In carcinoma of Visceral glands, a chain of events may be inferred which is analogous to the causation process in the special female organs—viz., an organ past its prime, with the cell elements undergoing devolution; secondly, some source of aberration in that process.

Carcinoma is, more than any other variety, the disease of 'decaying organs and decaying people.' It is very rarely seen in the young.

III. Sarcoma—The Cancer of the Connective Tissues.

The absence of an appreciable neurotic element in causation conspicuously differentiates sarcoma from carcinoma.

A true sarcoma is usually engendered by direct injury, hardly ever by mental trouble or like agencies depressing

the cerebral nerve centres. It usually follows a blow or strain, the latter implying rupture of fibres, with consequent inflammation and irritated cell nuclei.

The majority occur on bone.

When following sudden injury to a long bone, it is noteworthy that the antecedent violence is nearly always slight, and not such as to involve disablement. After a fracture, sarcoma is of exceptional occurrence. When the patient is confined to bed after an accident, repair takes place. When he goes about as usual, the ruptured fibres and their nuclei are kept long in a state of unhealthy excitation, and thence follows malignancy.

The well-organized forms of connective tissue, such as tendons, are practically exempt from the cancer process. The immature, and those which still retain a large number of non-organized cells, are the most liable. Cartilage occupies a middle position.

The Periosteum of bone is specially prone to sarcoma, because, in the first place, it contains numerous cells—the 'osteo-genetic' layer—from which the bone is constituted, and which remain actively concerned in its nutrition even after full maturity; secondly, the bones of the extremities are particularly exposed to casual knocks.

The great bulk of malignant bone tumours are periosteal sarcomata. A relatively few, the so-called 'central sarcomata,' spring from the marrow, and belong rather to the class following.

Sarcomata of the Jaws exemplify the effect of chronic irritation in causing cancerous development. Sudden violence is seldom the forerunner.

These arise near carious teeth in the periosteum of the gum. There is long-antecedent congestion of that and the mucous membrane. The cancerous development is sometimes primary, sometimes the sequel of a benign tumour (Epulis).

Men are more prone to sarcomata of the jaws than women, for the same reasons as those which lead to epithelial cancer; to sarcoma in other bones, because of their more laborious occupations and greater exposure to injury.

Though most of the patients are old or middle-aged, yet a very considerable number of the young, down to children in the first years of life, fall victims.

Sarcoma thus constitutes an exception to the rule of cancer as a special disease of age, apparent in every other non-congenital species.

This is explained by the functions of the periosteum, and its relation to bone development. Many bones do not reach maturity till adult age: the humerus not until the twentieth year; the pelvic bones, femora, tibiæ, and fibulæ, are not completely ossified until the twenty-fifth. Throughout growth contusions are frequent. Upon the general theory, the more embryonic any tissue, and the more active the cell growth therein, the higher its liability to cancer.

In young women of the domestic class, large masses of cartilage, combined with the spindle-shaped cells of sarcoma, not rarely appear at the shoulder. I have seen one or two cases of the same in sailors.

These chondro-sarcomata grow slowly to an enormous bulk when neglected, though easily cured by radical removal within a term of several years from the beginning. They are caused sometimes by a blow, but more often by overstrain in carrying weights, the bones of the shoulder-girdle being all immature until the twenty-fifth year.

As the whole body is built on a framework of connective tissue, true sarcomata may obviously arise in any part or organ thereof; with the exception of the highly specialized connective tissues of the marrow and nerve-centres which generate cancerous tumours of a distinct class.

Organs well protected from injury are, however, all but immune. Relative liability to sarcoma rests almost wholly on exposure to contusions or chronic irritation.

Elsewhere than in bone, as in the fasciæ or inter-muscular spaces, sarcomata commonly follow a sprain or strain (rupture of fibrous tissue), and the youthful rarely suffer.

The development of mammary sarcomata is referred to in the chapter on Benign Tumours.

Numerically, sarcomata constitute a relatively small percentage of the gross total of cancers.

The vague employment of the term to denote any malignant tumour of unknown origin, as well as many congenital blastomata, is strongly to be deprecated.

Hardly less so is the pedantic attempt to distinguish sarcoma from ‘ cancer.’

IV. Lympho-Carcinoma—The Cancer of Lymph Glands and of the Lymphoid or Adenoid Tissues.

Also termed 'lympho-sarcoma.' The title implies an affinity to sarcoma, which does not exist.

As 'lymphadenoma,' confounded with Hodgkin's disease, a pyrexial malady unrelated to cancer.

The variety most often attacks a lymph gland, but may arise in one of the numerous patches of adenoid tissue scattered throughout the body, as in the omentum, pleuræ, stomach, spleen, pharynx, nostrils, etc.; also in the tonsil.

The Bone Marrow, being an adenoid structure, generates lympho-carcinoma, which thus includes the rare central malignant growths of bone.

Into this class correctly fall many cancerous growths in the thorax and abdomen, consisting of round or ovoid cells, and recorded as 'round-celled sarcoma.'

The exciting cause is most often mechanical, a blow or strain. See causation table of twenty-four cases in *Treatise*, p. 337.

Frequently, however, some conspicuous source of mental depression immediately precedes, and there is no history of injury.

Especially in the cervical lymph glands the cancer process is secondarily grafted on enlargement from some ordinary septic cause, such as diphtheria, tonsillitis, pharyngitis, tubercle, dental caries.

The glands are then for weeks assiduously painted with iodine until auto-infection has been fully established.*

V. Cylindroma—The Cancer of the Stomach and Intestines

—is almost always preceded, as in carcinoma, by mental anxiety and distress.

The disease is rare under the age of forty. The average of 223 cases of stomach cancer was 51 in men, 40½ in women. Of 13 patient with ditto in the colon all were beyond sixty. Of 41 with rectal cancer, 31 were upwards of forty.

As to cancer generally, chronic congestion predisposes. From sudden violence the position of the organs protects them for the most part. Continuous irritation and friction

* On the general question of reform in medical education, it may be not amiss to remark that iodine has been for a generation or two the routine application to enlarged glands, and is well-nigh useless. It brings suppuration quickly to a head, but has otherwise no beneficial effect whatever.

A British Medical Association committee, consisting of men in general practice, would do yeoman's service in procuring the abolition of this with many other stock modes of treatment of no higher value.

The use of cod-liver oil in phthisis is another instance of traditional 'lumber.' Consumptive people are dosed with it as a matter of course, and it sometimes increases their weight, at the notorious cost of a fatty liver! Whether any real benefit accrues is doubtful.

Such a committee should mainly consist of general practitioners who have been enabled to observe, from day to day, the effect of their prescriptions. The practical competency of the profession has greatly suffered by the abolition of the apprenticeship system, and by the complete divorce *ab initio* of the consultant from general practice.

The evil is enhanced rather than compensated, by stringent though unpractical examinations, preferring quantity to quality.

may be inferred to produce the same effect as in epithelioma; given a simple ulcer or casual scratch by fish-bones or other hard bodies.

The subordination in health of the gastric and intestinal functions to nerve control, and their derangement by depressing emotion, are hardly less manifest than that of the female cancer-organs.

Chronic Alcoholism is, for obvious reasons, a powerful factor of cancer in the alimentary tract. It is curious that the disparity of the sexes appears to vary so closely with exposure to the direct influence of alcohol.

Thus, 25 cases of pharyngeal and œsophageal cancer in males contrast with only 10 in women.

We note 82 men, 27 women, with ditto in lips, mouth, tongue, palate.

In the stomach, 2,116 males compare with 1,698 females.

Cancer of the intestines above the rectum attacked 46 men, 58 women. But the statistics of intestinal malignancy are very unreliable.

When, however, we come to the rectum, 20 cases are recorded in men, against 42 in women. That is to say, both sexes show equal proclivity, the figures corresponding to the numerical sexual disparity of the population.

Intestinal cancer is commonly, but not always, preceded by habitual constipation. Many instances of it are misunderstood, or even to the end overlooked. The deaths are then certified as due to inflammation of the bowels, gastritis, enteritis, or similar terms of doubtful meaning.

Even when recognised, no symptoms may attract notice till the disease is far advanced. Particularly is this the case in aged persons whose minds are giving way.

A sudden attack of fatal obstruction may be the first sign. And even then that condition, in the absence of operative interference or autopsy, is commonly assigned to other causes than cancer.

The hæmorrhoids from which nearly every elderly adult in the civilized state more or less suffers, largely account for the frequency of rectal cancer.

Neither this nor any form of gastric or intestinal lesion compares numerically with the female special organs.

Cancer of the stomach (certain previously quoted statistics notwithstanding) is comparatively uncommon in England. Sundry fallacies abound in relation to it. Chronic dyspepsia is often mistaken for the more grave disorder.

Whenever a medical writer seeks to refer cancer to some microbic or climatic source, as when 'cancer houses' are cited, it may be noted that almost always several individuals are said to have died of cancer of the stomach. The same remark applies to many reputed cancer-cures, as lately to celandine.

VI. Rodent Ulcer—The Cancer of Short Hair Follicles

—is almost wholly restricted to the eyelids and cheeks.

The disease is practically a variant of epithelioma, and its causes are the same—chronic friction.

Rather seldom, a wart precedes. More often, a casual breach of surface passes into a malignant sore.

Men and women are equally liable.

The remaining cancer-varieties are too rare to affect appreciably the death statistics, and too obscure for a valid account in the present work of their causes.

CHAPTER IV.

STRUCTURE.

EXAMINED under the microscope, the characteristic features of all 'cancer' are two:

1. Inordinate multiplication of cells.
2. Erosion by these of the healthy parts around.

Its cells are invariably derived from the normal cells, and retain special marks of that origin, resembling these as the child resembles the parent.

The offspring of epithelial cells always secrete mucus; of pigment cells, melanine; carcinomata copy the acini of the parent gland; connective-tissue growths retain the characteristic spindle-shaped cell, and its tendency to organisation into fibres. The cancer of short hair follicles closely resembles their structure in a modified form; that of tubular follicles is also ranged in tubules or cylinders, and so on.

On the other hand, very distinctive points of dissimilarity must be noted in the individual 'cancer cell,' as it was formerly, and not inaptly, termed. These indicate rapid growth and exuberant fertility.

Multiplicity of nuclei is the most salient characteristic of malignant cells, whatever the species. With a moderate

microscopic power we see, in place of the relatively small central nucleus of the healthy cell, either one or several huge ones, occupying various positions in its protoplasm ; sometimes also central, but as a rule not so. In each is a nucleolus, sometimes more. Applying a still higher power, several additional smaller nuclei come into view, and those previously seen are often found to be undergoing cleavage into another generation of nuclear bodies. With a higher power still, the number is again enlarged, though, of course, the outlines are more indistinct.

This progressive increase with higher magnification is naturally best seen in the large cells of Epithelioma, Carcinoma, or Spindle-Sarcoma. The rule, however, no less applies to the relative minute cells of Lympho-Carcinoma.

The cancer-cell itself, to our senses, appears an irregular fragment of jelly-like material (protoplasm), indiscriminately studded with actual or potential nuclei. There is no cell-wall or definite boundary. The outline is torn and irregular. Ill-defined areas of the interior appear to be in process of specialization, *i.e.*, elaboration into fresh nuclei.

Proliferation takes place, apparently, by this nuclear specialization of the protoplasm, combined with subsequent cleavage of the nuclei so formed. Both processes are highly irregular, obeying no definite rule. That subdivision of nuclear fibrils known as 'mitosis,' 'karyokinesis,' has been observed in epithelial cells in an aberrant form, but exceptionally.

Owing to the prevalent custom of examining only cut sections of malignant growths, much of the above has now

passed out of sight. From too great reliance upon the 'cancer-cell' as indicative of malignancy, pathologists have swung round to the opposite extreme. Microscopists content themselves with inspecting slices of the tissue, subjected always to an elaborate process of preparation, and so often materially altered from the natural state.

No accurate knowledge can be obtained, and no advance take place, without due regard to both these procedures, without investigating the details of individual structure, as well as those of relative arrangement. And the delicate cell structure can be safely studied only in the fresh state, with as near an approach as possible to natural life-conditions.

In addition to the distinctive cells, and their natural or degenerative products, we always find in the microscopic section a conspicuous army of leucocytes immediately surrounding the cell masses. A cancerous growth is thus accompanied by the same inflammatory phenomena as would be a foreign body inserted within the tissues.

Mingled with the cancer-parenchyma proper are the products of secretion or of decay, and the normal tissues.

I. Epithelioma, or Epithelial Cancer.

The simplest type of 'cancer' and of cancer phenomena.

Inclusion of Epithelioma with Carcinoma under a common title overlooks a material natural distinction.

The infective particles from an Epithelioma are wholly arrested by the adjoining lymph-glands, and only rarely

reach the blood in a vital condition. See cases of the latter event at p. 80 in *Treatise*.

On the other hand, those of Carcinoma quickly fill the lymph-sinuses and block up the gland. They then pass into the current of the circulation with their vitality unimpaired; are thus grafted on distant parts or organs.

In Epithelioma visceral deposits are most exceptional; in Carcinoma invariable, and often early.

In Epithelioma the lymph glands near permanently arrest infection; in Carcinoma they only do so temporarily.

A microscopic section of Epithelioma shows the healthy tissues pervaded by columns of new cells, with the special features above stated. Mingled therewith are the structures known as 'Globes Epidermiques,' 'birds' nests,' or 'laminated capsules.'

These have been ascribed to endogenous cell formation. They are really a degeneration product, the epithelial cells continuing their normal mucus-secreting function after they have become cancerous.

Thus occur areas of decayed cells with globules of mucus, around which are concentric laminæ. While the inner decay, the outer are compressed between these and the still more distant peripheral growing cells, and are thus converted into flattened scales. For plate showing the three stages of development, see *Treatise*.

In Melanotic Epithelial Cancer there are none of these bodies, the mucus being replaced by melanine, the natural pigment.

II. Carcinoma.

The microscopic phenomena vary materially with the secreting gland whence the disease has sprung.

Cell-grouping in Acini is generally described as the main characteristic of the species. That feature is most pronounced in mammary carcinoma of the chronic variety, the familiar scirrhus.

In Acute Mammary Carcinoma, the acinar arrangement, in sections from the more central and advanced parts of the mass, may be wholly wanting, while sufficiently obvious at the periphery.

Acinar structure is hardly noticeable, often not at all, in cancer of other glandular organs, such as the kidney, testis, pancreas. The tumour then consists of a heterogeneous cell mass, whereof large portions are decaying, and of abundant leucocytes.

The so-called 'stroma' of a carcinoma is the normal fibrous-tissue framework of the affected part, within the meshes of which the cells plant themselves and grow. In Chronic cases this framework becomes toughened and hypertrophied, offering resistance to the eroding cells. In Acute, which for the most part are seen in individuals of vigorous habit relatively youthful, the fibrous reticulum, being soft and succulent, does not exert any restricting influence, and is readily devoured by the autosites, so that little beyond the cells themselves is visible under the microscope.

III. Sarcoma.

The characteristic feature of a true Sarcoma is spindle-shaped cells, ranged in strands or bands. They contain the usual multiple and large nuclei.

In the acute, rapidly-growing forms, many cells betraying an infinite diversity of shape, with round or oval nuclei, are seen mingled with the preceding. Enough of the latter, however, always remains to stamp on the growth the badge of its connective-tissue origin.

A Sarcoma differs from Epithelioma and Carcinoma in being the product of tissue previously organized, and not of non-elaborated cells; hence the new growths are themselves in some measure organized, and the microscope shows, often in one and the same tumour, a well-marked gradation from perfectly healthy fibrous to highly malignant parenchyma.

There is great variation in the size of the new cells, from the relatively huge cell-elements of many periosteal sarcomata to the minute oat-shaped products of the neuroglia.

General virulence, rapidity of growth, tendency to diffusion, proneness to end life, are in inverse proportion to what, in order to hide our ignorance of ultimate vital processes, we term 'capacity for organization.'

IV. Lympho-Carcinomata.

These are masses of small lymphoid cells, resembling those of the normal lymph glands in general contour, differing in being multinucleated and slightly larger. Progressive erosion is conspicuous.

V. Cylindroma.

The word 'Cylindroma' is, unfortunately, vague. It has been used in divers senses by different authors, so that, as with many other pathological words, no one now knows precisely what it means.

It very aptly designates the microscopic phenomena of the special variety of cancer which attacks the stomach and intestines, and which consists in an aberrant reproduction of Lieberkühn's follicles.

I have therefore, with much hesitancy and for want of a better word, ventured to employ it in that restricted sense.

The title 'Columnar Epithelioma' is objectionable, because the shape of epithelial cells is a most unstable attribute, varying, as hourly in the bladder, with slight changes of the environment; secondly, because columnar epithelial cells, *as such*, do not generate a cancer microscopically differing from the ordinary Epithelioma, the product of pavement epithelium.

Cylindromata are restricted to the stomach and intestines. Cancer of the uterus somewhat approximates to them in structure during the earlier stages.

Elsewhere the so-called 'columnar epitheliomata' seem to be of the congenital class—Blastoma.

The characteristic Cylindroma consists of irregularly-shaped tubules, lined by columnar epithelium. There is erosion of the surrounding tissues, and the usual investing cloud of leucocytes.

VI. Rodent Ulcer

mimics hair-follicle structure, with its branching, irregular columns of minute epithelial cells similar to those normally composing the outer root-sheath.

These columns slowly penetrate the healthy parts, and inosculate, the tissue thus infiltrated ulcerating away. Around is the army of leucocytes. In an early specimen, the sebaceous gland (to which structure this form of cancer has been erroneously ascribed) may be observed lying healthy at the bottom of the empty hair follicles (see Plate VII. in *Treatise*).

VII. Gliomata.

Some Gliomata are composed of minute fusiform cells, indicating origin from the connective tissue of nerve substance (neuroglia); others of small roundish corpuscles, without admixture of spindle cells, probably derived from the nerve-cells themselves.

VIII. Myo-Sarcomata,

generally derived from benign 'Uterine Fibroids,' show in part the normal non-striped muscle fibres of the latter. The malignant portions are composed of spindle cells, and many small round or oval cells, with the typical nuclei. These are interspersed among bands of healthy non-striped muscle.

IX. Endotheliomata,

or growths so described by eminent pathologists, consist of minute round lymphoid cells ranged in alveoli, and occurring on a serous membrane.

Occasionally the alveolar spaces are lined by cylindrical epithelium, or cells identical therewith in appearance.

There has of late been a tendency to record Endotheliomata in other sites than the serous membranes, as, for example, in the ovary.

The nature, and even the very existence, of the group is already sufficiently doubtful and obscure without this added element of *a priori* improbability.

The stable character of endothelial *plaques*, wherever situated, renders these cells a very unlikely prey to the cancer process.

So-called **Myeloid Sarcoma** contains giant-cells in addition to the spindle-celled structures of Sarcoma. They are not known to influence its clinical career in any way. Myeloid corpuscles occur under many varied circumstances—*e.g.*, tubercle, repair or ulceration of bone, the walls of mammary cysts, etc.; in a case of my own (believed unique), of mammary carcinoma. The spindle sarcoma in which they are found has no necessary connection with bone.

Melanotic Sarcoma consists of spindle-cells containing melanine, the natural pigment of the body. These normally occur in the eye, and the disease is practically limited to that organ. Very rarely it may elsewhere spring from an embryonic vestige or degenerate nævus.

Melanotic Epithelial Cancer arises in the pigmented epithelium of the Malpighian rete, and attacks only the Skin, generally following a pigmented wart, which microscopically will be found to consist mainly of pigment-bearing epithelium.

Masses of melanotic roundish or irregularly-shaped cells infiltrate the tissues. Spindle-cells are absent.

There are no 'globes epidermiques' as in ordinary epithelioma, because the Malpighian cells secrete melanine, not mucus.

There is early lymph-gland infection, followed by diffusion *per* the blood.

Distinction between the two species, outwardly alike, of Melanotic Cancer has material practical importance in view of 'anticipatory' gland-excision.

Osteoid Sarcoma grows from the bones and is generally developed through cartilage. There is attempted ossification of a spindle-celled matrix. The structure of true bone is mimicked by ill-shaped lacunæ, short canaliculi, sometimes Haversian canals. The tumour may be friable, chalky, white; or dull yellow, hard as ivory. There may be myeloids. Cartilage, spindle cells, oval or round cells, vary in amount.

Myxoma is a tumour of the connective tissues, whose gelatinous appearance is its most salient characteristic.

There are two forms—Benign and Malignant. In the former, the jelly occupies a well-organized fibrous stroma without spindle cells. There is no auto-infection or erosion.

In the cancerous, a branching reticulum of spindle cells, with large nuclei, pervades the gelatinous base. The lesion is practically Sarcoma, virulent and quickly diffused.

Heat and acetic acid coagulate the jelly in both. Gelatine is obtained on boiling.

Colloid Cancer owes its name to the presence of a glue-like material, or jelly, in conjunction with the tissue proper of Carcinoma or of Cylindroma. In many respects the condition is highly mysterious, as well as rare.

The prevalent idea is that we have here 'a disease within a disease.' That Colloid bears to the two cancer species aforesaid the same relation as Myxoma to Sarcoma, viz., that as the connective-tissue corpuscles of the latter degenerate into mucine, so the cells of Carcinoma or Cylindroma degenerate into the colloid matter.

My case, reported at the Pathological Society (December 17, 1895), entirely controverts that view, so far as the particular instance was concerned. The thin sections of a small and early Colloid Carcinoma of the mamma showed at one end scirrhous acini, at the other healthy breast tissue. Both the cancer acini and many of the perfectly normal lobules adjacent were enveloped by a hyaline exudation plainly issuing from the fibrous stroma, which appeared to be degenerating.

The cancer cells were not *per se* degenerating, but were being destroyed by this exudation or conversion product. The disease must thus be referred, of course provisionally, to some idiosyncrasy in the connective tissues of the individual.

The careful study of small, seemingly insignificant, examples of Colloid Cancer, or, indeed, of any obscure malignant disease, alone avails to throw light on their causation and pathology.

Unfortunately, such are commonly passed over unheeded. The large and showy tumours, or 'interesting

cases,' which alone attract the attention of learned societies, are as a rule perfectly valueless for any scientific purpose at all.

We can thus readily understand why, in our knowledge of Colloid Cancer, hardly any progress has taken place in the past three-quarters of a century, and that certain stock assertions of its chemical properties, which greatly need verification, are still passed on as facts from one text-book to another.

Thus, sulphur was once found in the colloid material. Ever since, the student has been expected to testify to its presence as a characteristic of Colloid Cancer. No one knows, however, whether sulphur is always, or is even commonly, present. So far as my knowledge goes, no case has been chemically examined for many years.

It is further stated that the jelly on being boiled yields no gelatine, the point differentiating Colloid Carcinoma from Myxoma.

No reliance can be placed on these, or on any other chemical dicta. Analysis of the material taken from a series of cases in different parts of the body is greatly needed, and might well produce important *practical* additions to our knowledge.

For in this peculiar condition we have an apparent attempt by Nature at spontaneous cure.

In the Mamma that attempt is always more or less successful. There is material arrest of the ordinary course of Carcinoma. I have met with one or two cases in which the disease had lasted ten years or more, had

not infected the glands or impaired the health, and seemed perfectly stationary.

On the other hand, Colloid affections of the Ovary or Intestine run a career as rapidly fatal as any example of cancerous disease, not possessing the gelatinous constituents, in those organs.

Microscopically, two cancer-varieties are seen to form the basis of Colloid Cancer, viz., Carcinoma and Cylindroma. In the latter (see Plate XIII. in *Treatise*), the characteristic tubules are enormously dilated and filled by very large plugs of jelly. In the former, masses of structureless jelly envelop, or are blended with, areas of typical cancer-cells.

The Locular or Alveolar appearance, which has conferred a special title on the species, is comparatively uncommon; though then sufficiently striking, with its large pouches containing a few cancer cells, and the concentric layers of their round or oval walls.

The old-standing mammary colloids resemble to the touch a smooth water-worn pebble embedded in the breast tissue. The hardness greatly exceeds that of Scirrhus. On section they resemble in consistency a mass of boiled rice, yellowish in colour. Small pellets can be easily scooped out of little cavities in the homogeneous base.

The unfortunate application of the word 'Colloid' to any gelatinous or mucilaginous matter, such as the normal secretion of the thyroid body, serves further to perpetuate the prevailing darkness.

The very rare morbid condition described as 'Multiple Cysts in Divers Organs' (see Appendix B., *Treatise*) is explicable only on the supposition of an advanced colloid degeneration, the contents of the above-described loculi becoming completely converted into a fluid or semi-fluid material.

Capsules—Encapsulation.

Much stress was formerly laid on the question whether a cancerous growth was encapsuled, or, *per contra*, occurred as an infiltration. The capsule was regarded as a feature of the cancer.

It is, however, but an adventitious adjunct. Nearly always a 'Capsule' is but the wall of a cyst, into which the cancer has grown.

Occasionally the normal fibrous envelope of the organ attacked is described as its capsule.

Thirdly, the long-continued pressure of a very slowly-growing tumour gradually effects the hypertrophy of fibrous tissue or fasciæ around. Thus a quasi-capsule is produced, a thickened envelope, more or less blended with the new growth.

CHAPTER V.

SYMPTOMS—COURSE—EARLY RECOGNITION.

THE phrase 'Pre-Cancerous Stage' occasionally met with can have validity only in the cases of cancer-development secondary to a Benign Tumour.

We know no constitutional antecedents to cancer, except such as are common to many other diseases, or do not necessarily involve disease at all.

The great majority of cancers begin insidiously and painlessly. Often there is entire absence of any unpleasant sensation, much more of pain, for weeks, or even months.

As a rule, the more acute and rapidly progressive a cancer, the less pain does it primarily cause. The reason is that the white fibrous tissue which usually invests the proliferating cells is readily eroded by them, hence absence of Tension.

On the other hand, resistance by fascia or tenacious fibrous tissue involves tension and severe suffering, more marked in chronic cases.

The true pain of cancer commonly begins only with ulceration. Those varieties, such as Epithelioma, which

from the first are associated with an open sore, are the earliest to display it.

The same cancer-species in different organs, and even in different individuals, gives rise to very varying degrees of pain.

Even Tongue-Epithelioma, commonly the most agonizing of all, is sometimes all but painless till a very late stage.

Here the suffering is mainly due to the infiltration or irritation of very numerous sensory nerves. Secondary inflammatory or necrotic conditions aggravate it in an extreme degree.

The most painless throughout its whole course is malignant disease high up within the Rectum.

The most useful type of the cancer group in general is Epithelioma; that is to say, a careful study of its phenomena—causative, clinical, and microscopic—furnishes the simplest and least complex example of the Cancer Process.

There is always a palpable local exciting cause. Any suspicion of Hereditary predisposition rarely arises. From the single small initial lesion, the course of all the subsequent Auto-infective manifestations can be clearly traced.

I. Epithelioma.

Epithelial cancer is most often seen on a mucous membrane, or at the junction of the skin therewith, the individual being upwards of forty years old, the general health bad, the mucous membrane itself morbid.

In some situations, the species is one of the most slowly growing of cancers; in others, one of the most virulent and acute.

Upon the Tongue, it falls within the latter category. A minute crack or excoriation remains several weeks without healing, and meanwhile is rubbed continuously by a projecting tooth or stump. At the end of that period slight darts of pain are occasionally noticed, with a more persistent sensation of heat and uneasiness. A little sore forms, and extends. Within about a fortnight more this begins to show the characteristic marginal induration.

Almost simultaneously with the appearance of the typical hard edge, Auto-infection is established. The 'infection-path' is always particularly regular and definite, and the time constant. There is always deposit in the adjoining lymph-glands within six weeks.

Disease of the anterior two-thirds of the Tongue first infects the *submaxillary* lymph glands, immediately under the lower jaw on the side of the disease, and in contact with the anterior margin of the salivary gland bearing the same title.

In cancer of the posterior third, the *superficial cervical* lymph glands just behind the angle of the lower jaw first receive the infection, the submaxillary remaining free till much later.

A few cases of disease beginning deeply at the root of the Tongue, or perhaps rather in the adjoining regions of the pharynx, first infect the *deep cervical* glands under the preceding.

Within the infected lymph glands there ensues insidious cell-growth, without any symptoms whatever, for two or three weeks. During another fortnight there is tenderness on pressure without increase in bulk. Lastly, enlargement begins.

The glands quickly increase in size, diffusing infection to others on the same, and later on the opposite, side. The whole neck may eventually become a huge nodular mass. They then soften, and the skin is found livid and inflamed.

When distension has become extreme, ulceration takes place, and the curdy, semi-purulent contents are evacuated. There is temporary relief, but an open sore persists, and further abscesses occur in other glands with the same result.

Meanwhile the primary cancer has rapidly extended. The edges are hard, livid, jagged-looking—here everted, there undermined. The surface alternately extends over, or is overlapped by, the tumid mucous membrane.

The base of the sore is foul, granular, uneven. It is solitary. Only exceptionally are several ulcers seen, when the whole tongue is pervaded by the cancer-infiltration.

Latterly, large portions become black and gangrenous.

Pain, at first slight and burning, with occasional neuralgic darts up to the ear, becomes in the end more excruciating than in any other part.

Earache, headache, profuse salivation, add to the distress. The breath is insupportably fœtid. The teeth become loose and fall out. Hæmorrhage occasionally takes place.

Death is produced by a combination of factors, the chief being blood-poisoning by septic processes in the wound and glands; with this co-operate the pain, hæmorrhage, impediment to food-ingestion.

Futile though it may be, we cannot fail to recognise, in the lymph-gland infection, an attempt by Nature to circumscribe the evil.

A lymph-gland is a natural filter, straining from the lymph all noxious materials before that fluid is permitted to reach its destination, the blood.

These materials are retained in the gland, and largely, if not wholly, digested by the gland cells, or by some secretion therein.

The phenomena of many cancer-cases indicate that cancer-protoplasm, fragments of nuclei, or cells, are to a large extent destroyed within the lymph-gland, most probably by the phagocytic qualities of its cells. In the end, however, the latter are overpowered by stress of numbers.

The infection of Epithelioma is permanently arrested by the lymph-glands in proximity. Only very rarely does it pass beyond to the blood, and thus to distant parts.

Auto-inoculation by Epithelioma on a mucous tract is a common feature.

Cancer cannot be transferred by inoculation from one person to another, except in the rarest possible instances, and with the utmost difficulty. Of innumerable experiments to this end on the lower animals, hardly any have succeeded.

Yet, strange to say, in a person afflicted with cancer, grafts are effected by Nature with ease.

When, in Tongue-Epithelioma, the patient has reached the later stages, little white specks appear on the palate

and fauces. These are casual inoculations of cancerous epithelium.

They soon develop into small ulcers of the characteristic Epitheliomatous type. They occur too late to do appreciable harm.

The common clinical fact of their occurrence serves, however, to support the Autositic Theory of Cancer, and to contra-indicate the Parasitic ; for were cancer due to a microbe the numerous artificial inoculations could hardly have proved such utter failures as has hitherto been the case under the most favouring conditions.

On the other hand, given an already cancerous person, Nature has no difficulty in grafting the peccant cells on any surface—mucous, serous, even cutaneous (*Treatise*, p. 6)—with which they are placed in contact.

Upon the Lips, seldom the upper, commonly the lower or the commissure, Epithelioma runs a much more chronic course than in the tongue.

The difference, however, has been much exaggerated by the inclusion in medical works of many non-malignant cases. Not unfrequently a crack or ulcer here hovers on the borderland of malignancy for several years, repeatedly scabbing over and breaking out again, without advance.

These spurious cases eventually terminate in cancer. When once the cancer process is established, progress is sure and moderately rapid.

Infection of the Submaxillary lymph-glands always occurs within six months from the true cancer inception.

Passing through like stages to the preceding, the gland deposits develop less quickly, the growth of the primary

sore being also less acute. This shows the same hard livid edge, with fœtid discharge, caking into a black scab when left exposed. Pain is also lancinating, but trivial in comparison with that from Tongue-Epithelioma.

The Cervical glands, infected subsequently to the submaxillary, soften and suppurate; often attaining a huge bulk, while the primary cancer remains small.

Towards the end, patients with this or any other species of cancer in the lymph glands of the neck become maniacal, and have to be sedulously watched. Death is chiefly the result of septicæmia, due to the breaking down of these glands.

Warts on the face, being rubbed more or less continuously, are more prone to become cancerous than those on the trunk. The small crumbling wart, easily torn off, with exposure of a raw surface, is the most dangerous.

Developed at the border of an old scar, Epithelioma is extremely chronic. Tenacious fibrous tissue in any shape is a barrier very slowly penetrated by cancer, a point of some importance in reference to operative treatment.

Commencing in spots remote from a lymph gland, as on the toes or fingers, secondary infection is not established until several weeks, occasionally months, after the usual date.

The cardinal point in practice is to diagnose before gland enlargement.

When following a wart, the fact of ulceration is enough to proclaim the presence of cancer; but such cases are a small minority.

In the greater number, the cancerous development taken place in a pre-existing ulcer; then recognition is assured by—

1. Middle or old age.
2. Pain, burning, with neuralgic occasional darts.
3. Induration of the edges.

Lymph-gland enlargement follows later. The microscope may be invoked to corroborate, but only for that purpose.

II. Carcinoma.

The prevalent species of cancer in the mamma typefies Carcinoma of all other secreting glands, except in two important particulars.

Carcinomata of the thyroid body, pancreas, kidney, ovaries, etc., are not attended by the distal marrow-infection which is so marked and significant in breast cancer.

In the second place, they rarely show much difference in degree; do not fall into divisions of Chronic and Acute; are never Atrophic.

Mammary cancer is described in Chapter XV.

III. Sarcoma (True).

All malignant growths in fibrous tissue, fascia, cartilage, fat, bone, etc., are either Spindle-celled Sarcomata or variants thereof, presenting the same microscopical phenomena, with unimportant modifications.

The recognition of this principle would tend hardly less to amelioration in practice than to scientific simplicity and accuracy.

On the Jaws, and especially about the gum, Sarcomata often follow long-continued congestion, as does Epithelioma, but with the previous development of a benign tumour (*epulis*) in the majority of instances.

A little pedunculated growth appears near a carious tooth or stump. Cut off or ligatured without destruction of the periosteal base, it quickly reappears. After several of these ineffectual operations, growth becomes increasingly rapid, and also attended with pain. The bone is infiltrated, and fungous ulceration ensues.

A microscopic section of the primary epulis will show well-organized fibrous tissue, with nothing cancerous about it. One of the last-named will reveal typical Spindle-celled Sarcoma, sometimes with, but more often without, myeloid corpuscles.

Visceral secondary deposit follows simultaneously with enlargement of the lymph-glands under the jaw and in the neck.

There are conspicuous extremes in relative chronicity or acuteness. The rapidly-growing tumours are almost from the beginning fungous bleeding masses, infiltrating the bone ; promptly inducing general blood-infection, and death within a few weeks.

On the other hand, chronic sarcomata gradually increase to a large size without much affecting the health, and do not prove fatal for several years.

Pain depends largely upon tension. Many rapidly-growing sarcomata are wholly painless, so also are the very chronic. Tumours which involve an appreciable

amount of periostitis are accompanied by the characteristic gnawing pain, worse at night.

The neuralgic darts of Carcinoma and Epithelioma are not described by the sufferer from Sarcoma.

Sarcomata within the Maxillary Antrum are primarily painless and insidious. They are not noticed until distortion takes place. Then the cheek becomes prominent, the nostril blocked, the eye pushed outwards, the palate depressed.

Those which arise in the pigmented connective-tissue structures of the Eyeball are Melanotic, and are widely disseminated by the blood. Probably the dusky colour of the secondary deposits makes them appear more numerous than with the non-pigmented Sarcoma, though the lesion is really not more virulent.

The marrow is often implicated. For analysis of cases, see *Treatise*, p. 180. The whole face may become of a dusky-purple hue from diffusion in the subcutaneous tissue. Numerous blackish nodules may stud the skin of the trunk. Eventually a ghastly black though painless mass fills up and protrudes from the orbital cavity.

The capacity of the Bone-Marrow for holding Sarcoma deposits throughout a prolonged term of latency has not yet been so fully demonstrated as with Mammary Carcinoma. Cases of the occurrence will, however, be found here and there in the *Treatise*. One of Melanotic Sarcoma was latent for seven years.

Moreover, medicinal treatment, in view of possible infection of that structure, has rarely, or never, been in-

stituted. Sarcomata of the long bones are almost always dealt with by amputation, and nothing more.

Commencing in the fasciæ or in the intermuscular spaces, sites much less common than the bones, Sarcomata grow to a huge size slowly and painlessly. Then ulceration takes place, a bleeding fungous mass protrudes, and the blood is infected. The length of time during which these cancerous growths remain localized, and therefore permanently eradicable, is often remarkable.

'Wide dissemination by the subcutaneous tissue,' a tract with a very copious plexus of lymphatics, is a phenomenon more or less common to all forms of cancer which involve the skin. When primary Sarcoma attacks the integument, a rather rare event, scores or hundreds of stalked polypi eventually cover the body. Some of these cases have been recorded as Molluscum Fibrosum. One of the tumours is always primary; the numerous others follow as the result of auto-infection.

Sarcoma is the most common form of cancer in the Ovaries; but at present the congenital Blastomata have not been eliminated from the record, and malignant diseases of the female pelvic organs are involved in great obscurity.

Sarcoma is also developed in the kidneys, testes, broad ligaments, etc. But in all the derivatives of the Wolffian body, Blastomata are apparently more common than non-congenital cancer, and the phenomena of the latter cannot be perfectly appreciated or studied until all examples of the former have been excluded.

The early diagnosis largely hinges upon a knowledge of the antecedents, and the presence of an exciting cause. There must always be a certain measure of doubt as to

the nature of any intra-abdominal lump, however great the experience of the examiner. When the probabilities of cancer are strong, prompt laparotomy is, of course, indicated on three potent grounds.

True Sarcoma is common in the female breast as one of the two varieties of Intracystic Cancer. Apart from cysts, it is here rare; most of the cases so called are only acute Carcinomata.

The distinction is of vital consequence, in view of the question of anticipatory gland excision, and must be made at operation, if impossible previously.

Sarcomata, mammary or otherwise, do not infect the glands *per* the lymphatics. Gland-enlargement, when present, denotes therefore general blood-infection, and is synchronous with visceral deposits.

Mammary Sarcomata usually follow a blow or like injury. Emotional conditions have little or no share in their causation.

Sudden pain and increase in a long-existing 'lump' in the breast is a sure index of malignancy, which may be sarcomatous.

Sarcoma at the base of the skull may pass disguised under the name of Naso-Pharyngeal Polypus.

IV. Lympho-Carcinoma.

The species furnishes many examples of spurious 'Sarcoma.'

Of the Lymph-Glands, those in the neck most prone to enlargement from other sources are also the most liable to primary cancer.

A single gland is always the primary site of a cancer development. This progressively increases in size without the least pain or other indication of the grave malady in question. It quickly coalesces with several others into a knotty mass.

Growth becomes increasingly rapid, and the general health declines. The overlying skin adheres, becomes livid and inflamed, then ulcerates.

The ulcer of a Lympho-Carcinoma is circular, with clearly-defined edges, livid, looking as though punched out of almost natural skin. The edges are not warty, undermined, everted, or specially hard. The base is red, fleshy, granular, soft, and regularly rounded at first.

Eventually there is a wide surrounding area of livid skin, and the mass of fungous granulations becomes more irregular. There is surrounding inflammation, and suppuration in the other glands around, with continuous pain and speedy exhaustion. Mania marks the closing stage.

On the Tonsils (organs which are often also the site of Epithelioma), the species appears as a vascular new-growth, obstructing the pharynx, and infiltrating speedily the base of the skull.

Lympho-Carcinoma rather often arises within the abdominal cavity, generally in the lymph glands or omentum. It then is commonly unrecognised as 'Round-Celled Sarcoma.'

Similarly, intrathoracic growths from the mediastinal glands or residual Thymus are misnamed 'Lymph-adenoma,' the title proper to Hodgkin's disease.

Age and causation are the cardinal points in diagnosis at an early stage. The lymph-glands of the young enlarge on slight provocation, and with them tubercular lesions are common. Not so with the old.

If a gland in the neck or elsewhere enlarge from an obvious septic cause, such as diphtheria, dental caries, suppuration, and the symptoms are recent, the disease is certainly non-cancerous at the beginning.

Even then, should the patient be elderly and depressed with care, the cancer may supervene on an infection at first inflammatory. If the enlargement resist proper treatment, if it progress, if the health be obviously deteriorating, the onset of malignancy must under such conditions be suspected; no matter how painless the lump may be.

On the other hand, if the gland-enlargement appear in middle age without any obvious cause except trouble; or if it ensue upon a blow or strain, and do not quickly vanish under care; the balance of probabilities will be largely in favour of cancer from the earliest days.

As matters now stand, a primary cancer of lymph glands is rarely, if ever, recognised as such until the cure period has long elapsed, and the infection has become widely diffused.

There is no valid reason apparent why, with ordinary attention to the points stated, prompt diagnosis should not take place before there is any dissemination from the point of origin. Error lies mainly in non-suspicion of cancer; the individual being obviously, from the causation-history, liable to it.

V. Cylindroma.

The Rectum is the most common site.

Cancer of the upper portion commonly escapes notice until the disease has continued for two years, or even more.

There is no pain, and trivial bowel-disorder may well be set down to ordinary causes. The fact is therefore, to a certain extent, unavoidable and excusable.

A severe attack of hæmorrhage from the bowel is often the first danger signal. In a person of mature age, this should always lead to prompt digital examination, repeated, if necessary, under anæsthesia.

During this period, moreover, there is no appreciable failure in general health.

When the lower part is attacked, there is first a sensation of bearing down and heat, probably with some irregularity of the bowels.

After a period varying from six to twelve months, there is difficulty in evacuating the fæces, and straining efforts. The evacuations are slimy, fœtid, occasionally streaked with blood. There may be involuntary mucous discharge. Usually there are several calls in the day. The strength declines a little, though not markedly. The heat feeling passes into burning, and neuralgic darts occur.

Hæmorrhoids are the almost universal attribute of civilized races, and the symptoms are long referred to these, especially when the piles have previously given trouble.

A digital examination promptly clears up all doubt. The finger will detect an ulcer, with indurated edges equivalent to that of a Carcinoma.

Two types of Rectal Cylindroma demand recognition, as involving marked differences in clinical course, and as affording diverse materials for prognosis. These are the relatively *hard* and *soft* ulcer.

The harder the sore and infiltrated parts adjoining, the more chronic will be the progress of the disease, the more localized the deposit; the smaller the liability to infection of the Liver, the better the chances of cure by timely excision.

On the other hand, the soft vascular infiltration, with comparatively slight hardness of the adjacent area, offers a far inferior chance of cure, because secondary deposit in the Liver is very early established. It is almost a matter of course within a period of months, whereas in the hard variety that organ may escape for years.

This hepatic infection takes place by way of the superior hæmorrhoidal veins. Thus particles pass to the inferior mesenteric, thence to the splenic and vena portæ.

Local progress is also rapid. The pelvic and lumbar lymph glands are infected. Death takes place, mainly from the large Liver-deposits, within about two years, often less.

On the other hand, the relatively hard ulcer permits life for twelve or more years.

The hard rectal ulcer involves far more tendency towards contraction, with consequent narrowing of the bowel-calibre, than does the soft and acute.

The latter, indeed, is often wholly free from all liability to produce obstruction. In both forms there is much less prospect of this than is commonly assumed. Even the hardest cancerous infiltrations of the bowel dilate in the later stages, so that we then find a rigid tube of dimensions considerably wider than the normal.

Over the earlier periods of growth, the patient can usually be easily tided by careful nursing and enemata, without colotomy.

Occasionally we find the species characterized by 'fungous protuberance.' Then soft pedunculated polypoid masses fill the lumen of the bowel, with little or no induration at their base. They have been described as 'Villous' cancer.

Abscesses around the anal margin are a common result of cancer near the orifice, and fistulæ follow their rupture. Sometimes advice is sought for these, while the more serious disease within has been previously unheeded.

Tubercular or syphilitic ulcers of the rectum are wanting in the characteristic hardness of cancer, and readily distinguished by the tactus eruditus. Stricture after these will almost assuredly lead in the end to malignancy.

Mental unsoundness may completely mask the signs of rectal cancer, as of most other lesions remote from view.

Especially with very aged persons, whose faculties are impaired, a sudden attack of obstruction is often the first sign.

Digital examination is the essential measure of diagnosis, and should be resorted to whenever there is complaint of unpleasant sensations in the part. The predisposing

influence of age will always suggest suspicion, under such circumstances, of this, the most insidious of all cancer developments.

The earliest rectal cancer I have met with occurred at the age of twenty-nine, in a stalwart sergeant-major of dragoons. It was accidentally discovered, in a military hospital, after an attack of typhoid fever.

Above the rectum two portions of the intestine are specially liable, the Sigmoid Flexure and the Cæcum, because irritating bodies, such as fish-bones, seeds, or scybala, are apt here to lodge.

The symptoms are those of intestinal irritation : alternate diarrhœa and constipation, with tenderness on pressure at a particular spot. Eventually a hard nodular lump is felt. Flatulence, ever-increasing weakness, loss of weight, sensations of uneasiness, merging eventually into continuous gnawing pain, colic, nausea, dyspepsia, are concomitants.

Here again the condition is insidious, and usually until far advanced ascribed to other causes than the real. Hæmorrhage is indicated by tarry evacuations, but is uncommon until the later stages.

So also a sudden attack of intestinal obstruction may be the first sign, especially when there is mental impairment.

The two salient points which invoke suspicion of cancer are *advancing age* and *recent trouble or anxiety*.

The great bulk of intestinal cancers occur after the age of forty. Cases under thirty are exceptional. At a still earlier age the examples in statistical tables must be regarded with suspicion.

The symptoms of cancer in the Stomach vary considerably with the portion attacked. Most commonly (in 219 out of 343 cases) the disease attacks the Pyloric orifice.

The early signs are merely those of dyspepsia: flatulence, loss of appetite, uneasy sinking sensations in the epigastrium, a general 'falling off.'

A few months later, continuous gnawing pain and occasional vomiting lead to the discovery of a 'lump,' rather above and to the right of the umbilicus. It is markedly tender on pressure, and mobile.

Loss of weight follows rapidly. The growth eventually adheres to the liver, intestines, and abdominal parietes.

Jaundice follows secondary infiltration of the liver, with pressure on the bile-ducts. Some cases of so-called 'cancer of the liver' are derived from this source.

Adhesion to the parietes involves infiltration of the skin and muscles, ulceration, the protrusion of a fungous mass.

Vomiting is most marked in disease of the pyloric orifice; it may be wholly absent when other portions are attacked. It takes place at irregular intervals. I have never seen the sickness at regular periods after meals which text-books record. At first once in two or three days, it eventually occurs several times daily.

With pyloric deposit may take place distension. When extreme, a huge quantity of sour fluid containing sarcinæ is discharged once or twice daily. Distension, however, is by no means an invariable feature.

Hæmatemesis is exceptional in pyloric lesions; is most marked when the stomach is attacked between its extremities.

Cancer beginning at the Cardiac orifice involves symptoms akin to those of lesions in the œsophagus. There is difficulty in deglutition—the food is apt to regurgitate. With marked loss of weight, continuous gnawing pain below the ensiform cartilage, and felt rather to the right of the middle line, is complained of.

When the walls of the organ are attacked, and the two orifices are unimplicated, the signs, both subjective and objective, may be extremely insidious. There is, of course, no impediment to the arrival or departure of food. Cases are recorded in which death has taken place without a single attack of vomiting, though there was probably some mental failure masking the phenomena.

Emaciation is here conspicuous and rapid. With the dyspeptic symptoms already described, there is tenderness on firm pressure. Eventually the thickened walls of the viscus can be felt on palpation.

Many cases of simple chronic dyspepsia are erroneously diagnosed as malignant.

Conversely, many cases of cancer pass wholly unrecognised, death being ascribed to 'gastritis,' 'enteritis,' 'senile decay,' 'pernicious anæmia,' and the like.*

Unless arrested by Medicine, or cured by Surgery,

* The terms 'gastritis,' 'enteritis,' have no precise meaning. Their retention is a blot on medical terminology.

cancer of the stomach, implicating a vital organ, kills within two years as the utmost limit; more often within one.

VI. Rodent Ulcer.

The 'least cancerous of cancers.'

It is almost limited to the eyelids, especially the lower; and the skin immediately adjacent. It may attack the temporal region. I have never seen it anywhere else, though cases have been recorded by others.

Beginning sometimes in a tiny wart, sometimes in an abrasion, sometimes in a syphilitic or lupous ulcer, a small sore forms and assumes the characters of epithelioma, to which the species is cognate. The ulcer is shallow, superficial, with characteristic hard edge and little surrounding infiltration.

Progress is extremely slow, and, failing an easy cure within the first few years, proportionately sure. Although partial cicatrization may occur from time to time, yet the infiltration steadily advances for twenty to thirty years. By then 'the entire face is converted into one horrid chasm, with the eyeball dropping into the mouth.'

There is hardly any pain, and the general health is maintained almost to the end. Death may take place from some intercurrent disease, such as tuberculosis; ordinarily it follows from septicæmia or septic pneumonia. When the disease has reached the neck, hæmorrhage from the larger vessels contributes.

While concurring with cancer generally in 'steady progress towards death,' and in cell microscopic phenomena,

rodent ulcer materially differs from every other species in the absence of Auto-Infection. There is no visceral contamination.

I have never met with an indubitable instance of secondary lymph-gland deposit, though the fact is described by others. In any case, it must be extremely rare.

Discussions at professional societies show the most vague current ideas of what Rodent Ulcer really is. Almost any variety of chronic ulceration — syphilitic, lupoid, simple—is apt to be so described.

On its own ground, the lower eyelid and cheek, Rodent Ulcer is closely simulated by an extremely chronic species of Epithelioma, commencing as a small pimple or wart. The course of the two is practically identical. The latter has been referred (I think erroneously) to the sebaceous glands, and described as 'Adenoma Sebaceum.'

The recognition of Rodent Ulcer as a cancerous lesion is always of the easiest, but from the close resemblance in early stages to the preceding chronic epithelioma, it is not possible to be quite certain which species is in question until a section has been examined under the microscope.

Then the very small cells, in irregular columns simulating hair-follicle structure, which characterize true Rodent Ulcer, present a sufficient contrast to the much larger epithelium of the Epithelioma. The distinction is without practical consequence.

CHAPTER VI.

MEDICINAL TREATMENT, WITH CASE-EXAMPLES.

THE only means of radically curing cancer beyond the possibility of return is the mechanical destruction of every cancerous cell, nucleus, or fragment of nucleus. Whatever the method adopted, that is its aim and substance.

When this cannot be done, or can be effected but partially, the administration of suitable medicines of the 'neurotic' class goes far to arrest the progress of the disease.

Under favourable conditions, and when persistently carried out, this arrest is so complete and so permanent as hardly to fall short of cure.

Cancer, especially in its more prevalent forms, ranks as emphatically a disease of the central nervous system. The only medicines which are of the least use are those which powerfully influence the nerve-centres. Of such, Opium ranks first, Cocaine second.

It may well be that still more efficient agents will be eventually discovered. But no good can be anticipated from empirical blundering. Therapeutic improvement

can only follow research on this line, *i.e.*, among 'Neurotic' drugs.

The power of Opium, or of its principal constituent, Morphia, to sustain the vital powers under total privation of food, or severe exertion long protracted, is well known. Life can be maintained for many weeks on opium and water with no food whatever.

The same in exhausting disease of any kind. A lady patient of mine in the last stage of exhaustion from mammary cancer once lived thus thirty-two days without the slightest appreciable loss of strength.

Opium, the 'gift of the gods,' might well be better utilized under many casual conditions than has hitherto been the case. When a grave famine impends, prompt distribution of opium would usually avert loss of life till other measures could be brought to bear.

The horrors of shipwreck would be greatly mitigated, if not wholly prevented, by a supply of opium.

In old age, when the stress of battle is over, and naught remains but to endure with patience, a judicious use of the drug would not only confer comfort, but also promote longevity.

No conscientious practitioner would for a moment countenance resort to opium by an adult in the vigorous exercise of his faculties. But when these are gravely weakened, either by incurable disease or in the due course of Nature, and can be thus long sustained in face of impending breakdown, it is difficult to discern any moral objection whatever. The late Harriet Martineau was a case in point; and even De Quincey, who took laudanum

to excess, and so became its slave, was still able to get through much mental work.

In cancerous disease we find that opium not only prolongs life by 'sustaining vitality under exhaustive conditions,' not only annuls pain, not only alleviates the severe mental depression which is always present, not only precludes the constant feeling of sinking and exhaustion, but also has a marked objective effect on growth. Some of the most distressing phenomena are always materially alleviated, often wholly prevented.

Thus, the natural sequence of ordinary Mammary Cancer is ulceration. Then follow burning pain, fœtor, hæmorrhage.

The early administration of opium or morphia in doses graduated to the conformation of the individual will usually suffice to preclude all this. The disease will be diverted into an 'Atrophic' state.

The organ shrivels up, so as to become assimilated to the masculine type. The supply of arterial blood is materially lessened. The skin-covering remains intact, or, at the worst, shows merely surface abrasions, which again soon heal. No softening takes place, no abscess forms, the characteristic 'burning' pain of malignant ulceration remains absent. The breast becomes hard, fibrous, giving no trouble or inconvenience, and its secondary gland-deposits are also held in check.

The good effects of opium are most obvious in scirrhous carcinoma of the female breast, for several reasons. The part is susceptible of ocular examination, and its state can be readily contrasted with what we know

would take place under any other condition of treatment or non-treatment. In the second place, the organ is under the intimate control of the central nervous system, responding in function and in the state of its blood-supply to all the phases of mental emotion. Thirdly, at the period of life when cancer appears, the mamma has entered on a natural process of atrophy or devolution.

In this normal process the cell-elements gradually disappear, and are replaced by fibrous tissue, a change in the highest degree adverse to that cell-proliferation which constitutes 'cancer.'

The natural course of the mammary devolution, or permanent degeneration, is promoted by the twofold tranquillizing influences on the mind and on the circulation of opium. Here, as in nearly all scientific medication, our object is to assist Nature.

The proper rule is to commence opium-treatment as soon as the disease is plainly seen to be otherwise incurable. Above all, it is essential to place the patient well under the influence of the drug before any ulcerative process is in sight.

To withhold opium in cancer until suffering compels is a grievous error, if not worse. The disease will have advanced much too far for the full measure of benefit, although even then there will always be marked improvement.

Should an operation have taken place, with any prospect of subsequent reappearance ('recurrence'), it is important to commence opium-administration immediately after convalescence.

After a certain period of weeks, but seldom exceeding twelve, Mammary Carcinoma will have set up deposits in the Bone-Marrow, which there grow, ultimately infecting the blood, and causing 'recurrence' in various parts.

Ordinarily, and under such partial and temporary opium-treatment as is involved by out-patient attendance on the part of poor persons living in distant country districts, there is no sign as a rule of renewed growth for five to six years.

The period of latency may be considerably longer. The observation of several cases under my care has even led me to believe that the carcinoma and marrow-deposits may become encysted and permanently inert, so that the patient remains, to all intents and purposes, in perfect health. But I am not at present able to affirm this with absolute certainty.

Cocaine, the essential alkaloid of the Peruvian *Erythroxylon coca*, somewhat resembles Opium in its power to sustain strength under harassing toil. In addition, it possesses certain qualities of its own, specially valuable in cancer-treatment.

The local anæsthesia obtained by local absorption through a mucous membrane, or by subcutaneous injection, is the most useful of these. The next—really another phase of the same — efficacy in preventing sickness. Applied in spray or otherwise, it contracts the arterioles of mucous membranes, and may be employed as a useful prelude to some operations. In dilute solution it is a serviceable aseptic and deodorant application to malignant ulcers.

Thus, in that form of malignant disease to which males are most liable, Epithelioma of the Mouth-cavity or Tongue, the local action of Cocaine, combined with its remote influence upon the brain, confers on it peculiar importance.

Ulcers here cicatrize under its use; the 'burning' sensations cease; the distressing fœtor is obviated; nourishment can be freely taken with ease. In addition, the strength and general vitality are sustained indefinitely.

The same holds good with other portions of the alimentary canal, notably the Rectum. In cancer of the Stomach, cocaine goes far to prevent the frequent vomiting, besides promoting cicatrization of the sore. It markedly arrests the otherwise rapid downward course.

Opium is the sheet-anchor of internal cancer medication. The rule is to administer it in moderate and not too often repeated doses, whether by the opium-pipe or otherwise, whenever there is reason to apprehend return after operation. A small dose of nepenthe at bedtime is usually sufficient.

Directly any fresh deposit makes its appearance, cocaine should be added.

When the remote effects of Cocaine only are desired, it may be given in pill. When the local influence is needed in addition, as in affections of the mouth or other parts of the alimentary canal, the drug should be administered in solution.

In monkeys cocaine produces the symptoms of exophthalmic goitre; and females with enlarged thyroids show marked intolerance, the secretion of that organ

appearing to be stimulated. Cocaine is, therefore, inadmissible in the rather rare carcinoma of the Thyroid body.

In average cases, ½ grain twice or thrice daily can be taken without the smallest ill symptom, and is sufficient to procure the maximum of benefit. A few individuals can take 1 grain three times a day. No advantage is gained by going beyond this. An overdose involves palpitation and sensation of faintness, for which brandy is the remedy.

Intolerance of Opium or Morphia is nearly always the sign of some kidney-mischief. But women normally require a much smaller dose than men, and it is well to begin cautiously. Nausea after an average dose will suggest an examination of the urine. But the question is one of dosage only. A person with simultaneous kidney-disease and cancer requires a smaller quantity than the average, but cannot afford to be wholly deprived of this most necessary drug.

The Opium-pipe (Gamble and Co., 4, Edwardes Terrace, Kensington) is an efficient method of administering the alkaloids in such a manner that an overdose is impossible, and that the patient can graduate to individual needs the quantity required. There is less constipation.

Opium-smoking is, however, a very different affair from that of tobacco, requiring intelligence, with a little training. Otherwise the smoker may continue inhaling copious volumes of smoke without a particle of alkaloid, and absolutely inert.

The alkaloids of opium are volatilized only within a limited range of temperature, and by a single type of instrument, that perfected by numberless generations of Chinese. No other model is of the least use.

Smoked like tobacco, all the essential principles are burnt up, and none inhaled. The popular fallacy that Manilla cigars are soaked in opium is presumably unfounded. In any case, were they saturated with a concentrated solution of opium or morphia, no effect beyond that of the tobacco could possibly result.

Similarly, the proper opium-pipe can be so employed as to burn up every fraction of alkaloid, while the patient imagines himself to be smoking freely.

As explained in a former publication, the test of accurate inhalation is a peculiar fragrant and aromatic flavour, which, tasted by a slight motion of the lips, indicates the correct temperature.

As compared with opium, cocaine is but a recent discovery, of still more recent introduction into cancer practice (see papers with cases in *British Medical Journal*, September 19, 1896, and April 17, 1897). Hence the full measure of benefit from the conjunction of the two drugs has hardly yet been realized. The costliness of cocaine has compelled its restriction in hospital-practice to a few special cases.

One of these, Peter M., referred to in the second paper cited, has now been under treatment for nearly two years. He continues an inmate of the Cancer Hospital, with his disease, Epithelioma of the mouth, practically arrested. There was in the first instance (on June 1, 1896), extensive

ulceration of the gum, with a huge mass of infected glands impossible of removal by a surgical operation.

It is a grave error to regard surgical procedures as the sum and finality of cancer-treatment. With a non-curative operation—and these, under present conditions of tardy diagnosis, must necessarily constitute the majority—the attendant's duties only commence.

I have lately had recourse to a novel agent, which so far has been employed in but one very advanced case of disease, the patient living remote from personal observation, far away in the country. Under these unfavourable conditions, however, a life that would assuredly have terminated within a few weeks has been prolonged as many months.

As previously stated, I had long formed the conclusion that cancer-particles are extensively destroyed in the lymph-glands, Nature's filter or D-trap.

Whether this be through a secretion within the gland, or by a phagocytic action of the cells, is, of course, uncertain. But the fact can hardly admit of doubt. The course of many cancer-cases is otherwise inexplicable.

The fragments of protoplasm are obviously carried off by the lymph-current in large numbers. They are certainly in a vital condition, yet it is only after a considerable lapse of time that they continue to live and flourish. Up to a certain point they undoubtedly perish somewhere. The only question is, whether their destruction takes place in the lymph-current or lymph-gland. Many signs

point to the latter as the principal site, though both may be concerned.

In the end the battle is won by stress of numbers, and Nature ceases the unequal contest. Then ensue the familiar phenomena of gland-enlargement, followed by extension beyond.

Among the evidence pointing to this conclusion, the physical signs of (true) Mammary Sarcoma may be cited. Cell-fragments must reach the axillary lymph-glands in large numbers, and in a vital condition, exactly as in ordinary Carcinoma. Yet they never grow therein until the blood also is saturated.

The case of acute Mammary Sarcoma, with myeloid corpuscles, cited at p. 87 of *The Reappearance of Cancer*, emphasizes the point in a noteworthy manner. The axillary glands were here actually and palpably enlarged. Yet on direct examination they proved to have been converted into small cysts filled with old blood-coagula. There was no Sarcoma-tissue whatever.

That is to say, *the nuclear fragments of the Sarcoma-cells had been conveyed by the lymph-current to these glands, and had set up 'irritation' therein; but had lost their vitality and had not taken root.*

Probably many parallels to this highly significant case will be noticed, with enhanced professional interest in the clinical details of malignant disease.

Propinquity is a material factor in all secondary gland-infection by cancerous maladies. The nearer a primary Carcinoma, Epithelioma, or Melanotic Epithelioma, is to

a lymph-gland chain, the more speedily do the glands enlarge, and *vice versâ*.

A Mammary Carcinoma close to the axilla infects the glands almost immediately, so that often a large mass is found under the arm, with a small lesion over the edge of the pectoralis. Conversely, when the carcinoma appears close to the sternum no axillary deposit becomes apparent for several months. The clinical contrast is often very marked.

An Epithelioma on the Foot does not infect the inguinal glands with anything comparable to the rapidity with which the submaxillary or cervical lymph-organs are attacked in cancer of the face, tongue, lips, etc.

The fact indicates destruction of Cancer-protoplasm continued throughout several weeks or months.

Acting on the belief that this takes place in the glands themselves, either by the phagocytic action of the lymphoid cells, or by some secretion thereof, I have long sought a means of bringing the principle to bear upon cancer treatment.

After much difficulty, Mr. Charles Forbes, with Messrs. Warrick Brothers, of Portpool Lane, E.C., has succeeded in making for me an Extract of fresh Lymph-glands, which appears to retain the active qualities of the living tissue. It is administered in powder, or in 'Jelloids.'

I can at present speak of its effects only with hesitancy. It has been administered in a single instance, very perfunctorily. Yet, according to the testimony of the patient's medical attendant, who alone watched the case, it certainly added at least three months to life.

This case was specially indicated for such treatment by facility for bringing the medicament into direct contact with the lesion.

Under other conditions hypodermic medication would appear indicated. But I have not ventured to adopt this plan without previous investigation in the laboratory, and the Cancer Hospital, not being an educational institution, is unprovided with facilities for physiological research.

In July, 1897, Mr. H——, aged 44, was seen with a large ill-defined mass in the epigastrium. There had been very rapid emaciation, with gnawing pain, and vomiting about twice daily. The patient was unable to walk 100 yards, and was daily becoming weaker. The symptoms dated from the sudden death of a friend at his house in the previous December.

No doubt could be felt as to the cancerous nature of the disease, and everything pointed to a speedy end.

He was treated in a private nursing home with $\frac{1}{16}$ grain of Morphia, $\frac{1}{2}$ grain of Cocaine, in pill, three times daily; was carefully dieted. He smoked the Opium-pipe twice a day, and oftener when any unpleasant sensation arose. After a month the vomiting took place only at rare intervals, and there was conspicuous amelioration in health, strength, and spirits. The patient then returned to his residence in the country.

On September 14th he began taking 4 grains of the Lymph-gland Extract, in powder, at bed-time. Next week the dose was increased to 8 grains. On September 23rd two of the Jelloids, each containing 4 grains of

extract, were prescribed. On October 5 the notes run: 'Sleeps well, enjoys food, remarkably good spirits.' The patient smoked opium regularly, but took only an occasional dose of morphia with cocaine.

On October 26: 'Much better, but thin. Can walk a fair distance without effort. Says he feels very well. Slight burning pain after taking the jelloids.' On November 16: 'Much better; appetite good.'

Death took place without the least suffering on April 1 of this year. I did not see the patient after August, 1897, but am much indebted to the medical attendant, Dr. T. J. Selby, of Frodsham, for subsequent information, and for sedulous co-operation in the treatment.

The golden hygienic rule for all cases of palpably incurable cancer is *the most perfect passivity of mind and body that the conditions will permit.*—Sufficient occupation for the intellect, wherein Nature abhors a vacuum; but the most careful avoidance of either physical or mental fatigue.

Case Examples.

1. *Mammary Scirrhus—Extensive Dissemination—Absorption and Arrest under Opium-treatment.*

In March, 1880, Mrs. G——, 40, had the left breast excised for advanced carcinoma, as large as the conventional 'orange,' with several axillary glands enlarged, softened, and breaking down. The operation was, of course, 'palliative' only.

In January, 1883, there were inconspicuous signs of renewed growth around the cicatrix. The right breast

had become infected by a chain of subcutaneous nodules, extending across the back to the right axilla. As usual in such cases, the lymph-glands here had enlarged before the appearance of the breast-deposit.

By the following October the skin over the whole trunk had become studded with many scores of nodular bossy deposits. There were more than a dozen also on the scalp, face, and extremities, with signs of extensive visceral infection, such as harsh cough, extreme emaciation, dulness at the base of both lungs; pulse 117; respirations 36 per minute; severe pain. The patient could not reasonably have been expected to live more than three months. She was getting worse very rapidly.

Morphia was now prescribed, $\frac{1}{4}$ grain, with some belladonna, night and morning. There was speedy improvement; pain ceased; appetite returned. The extensive skin-deposits underwent an atrophic change, shrank, and, for the most part, disappeared, leaving a faint white stain. The right breast also shrivelled and contracted. No ulceration ever took place, or any approach thereto.

The amelioration was maintained until the summer of 1886, when ascites with liver-deposits supervened, and terminated life without suffering in the following November.

2. *Excision of recurrent Mammary Carcinoma, with Marrow-infection. Subsequent latency, with perfect health, after seven years.*

In May, 1891, a single lady, aged 64, was brought to me by Mr. A. E. Davies of St. Asaph with two large masses of scirrhous deposit, softened and degenerating,

under the scar left by an operation on the right breast six months previously. There was a very marked sternal prominence, with rheumatic pains about the scapula. No reasonable doubt that there was Marrow-deposit could be entertained.

Since removal of the disease, the patient has taken 5 minims, increased subsequently to 7, of Ferris' Nepenthe at bedtime. There has been no reappearance of the cancer. The patient goes about as usual, blissfully unconscious of anything wrong, to present date (April, 1898).

3. *Mammary Carcinoma excised in* 1879. *Immunity to present date (eighteen years). ? Encysted Marrow-deposit.*

E. N——, 51, married, had her left breast excised at the Cancer Hospital in October, 1879, for a scirrhous carcinoma as large as an orange. The axilla contained several large glands.

Marked sternal prominence between the second costal cartilages was noticed a year and a half afterwards. Unfortunately, the significance of this symptom had not then been fully recognised, and it is not known whether any natural fulness previously existed.

The patient now took opium rather intermittently for five to six years. There has been no further trouble in any shape.

E. N—— last came to the hospital in February, 1898, a florid, robust-looking countrywoman, with no trace of cancer except the unfelt sternal condition.

4. *Epithelioma of Mouth, with extensive gland-deposits. Arrest since* 1896 *under Opium-Cocaine treatment.*

P. G——, an old man of 60, applied in June, 1896, with Epithelioma far too advanced for operation. The whole right half of the lower alveolus was occupied by a characteristic ulcer, producing horrible fœtor. On the same side below the jaw was a mass of infected lymph-glands, larger than the fist, firmly fixed under the bone, and extending deeply into the neck. He took ¼ grain Morphia with ½ grain Cocaine in solution, at first twice, then three times daily.

Under this treatment pain ceased, the sore quickly cicatrized over, the bulky mass of glands remained stationary in size. They did not ulcerate or break down, as they could hardly otherwise have failed to do.

After a year's out-patient treatment, the patient was admitted into Ellis Ward at the Cancer Hospital, where he still remains (April, 1898). The huge mass of glands persists, but causes no trouble. The health is otherwise sound.

5. *Mouth-Epithelioma. Arrest under Obium-Cocaine treatment.*

An alcoholic coachman, aged 59, applied at the hospital in January, 1896, with advanced cancerous infiltration of the gums and floor of the mouth, with large deposits in the cervical glands. He was ordered ¼ grain Morphia with ½ grain Cocaine three times daily. Subsequently 1 grain Cocaine was given at a dose.

The previously severe pain ceased, the ulcer healed entirely, the glands underwent superficial erosion, but did

not as usual break down *en masse*, and the man appeared practically well. He did not attend beyond February, 1897.

6. *Mouth-Epithelioma, very advanced.*

On February 15, 1897, James Y—— came to the Cancer Hospital with a very deep Epitheliomatous excavation under the tongue, the cervical and submaxillary lymph-glands on both sides being infected and fixed. He was placed on similar treatment.

On the following April 26 the notes run: 'Much improved. No advance; no pain. Was able to perform seventeen hours' work yesterday as a fishmonger and poulterer.' No further attendance recorded.

7. *Sarcoma of Abdominal Muscles—Retrocession.*

In June, 1896, James G——, 64, was admitted into hospital with a hard nodular mass in the middle line of the abdominal parietes. There was a history of steady increase, progressive emaciation, gnawing pain, declining strength. The tumour was mobile, as large as 'a cocoa-nut.'

Exploratory incision revealed extensive infiltration of the muscles by what had every appearance of a malignant growth, though it is to be regretted that no microscopic examination took place. Removal was impossible; it would have involved excision of a circular area 5 inches in diameter, the entire thickness of the abdominal wall.

Opium-Cocaine treatment was followed by considerable shrinking in the size of the mass, and restoration to health. The man works regularly at his trade as a sawyer. There

has been no renewed trouble to date (April, 1898). Occasional out-patient attendance continues, rather as a matter of precaution than for any other reason.

8. *Cancerous Growth (? Myo-Sarcoma) in Broad Ligaments—Arrest.*

Ellen W——, 52, single, in May, 1895, applied at the Cancer Hospital with two solid hard masses distending the abdomen to the size of a full-term pregnancy. They were separated by a central cleft, and had grown continuously for two years. The patient was extremely emaciated, with severe continuous pain and marked exhaustion. It was impossible to doubt the malignant character of the nodular masses, which were too advanced for operative interference.

Under Opium-Cocaine the suffering wholly ceased, and the tumours diminished in size. The patient became florid, and was able to earn her living with a sewing-machine. To February last she was perfectly happy and comfortable. She then entered Nazareth House, and has been lost sight of.

9. *Ulcerated Breast-Scirrhus of sixteen and a half years' duration. Cicatrization of Ulcer (under Morphia treatment). No advance in four and a half years.*

H. H——, 55. In March, 1892, a scirrhous ulcer, surrounded by a wide area of livid infiltrated skin, occupied site of right mamma. The stated duration was as above. Under an ointment of eucalyptus with iodoform, and $\frac{1}{8}$ grain Morphia twice daily, the sore quickly healed. No appreciable advance took place to September, 1896, since when attendance is not recorded.

10. *Advanced Uterine Cancer.*

E. M——, 43, admitted February, 1893, into the Cancer Hospital in the last stage of uterine cervical cancer. There was deep long-standing ulceration, the pelvic tissues were infiltrated, the uterus firmly fixed. Extreme exhaustion and anæmia, severe lumbar and femoral pain, occasional hæmorrhage, constituted the usual distressing symptoms.

Under Opium-Cocaine the patient was able to go home in the following April, and take charge of her eight children. This she persisted in doing, in spite of earnest entreaty to remain passive in hospital. The treatment was therefore subsequently more or less intermittent, and was partially negatived by hard work. The poor woman died at her own home in September, 1894.

11. *A case of Mammary Carcinoma, showing the average course of Marrow-infection under very intermittent Opium-treatment.*

F. D—— had the left breast excised in June, 1887, for scirrhus with enlarged axillary glands, of stated duration three months, actual probably one year. There was a conspicuous sternal prominence, with other well-marked signs of Marrow-infection. The operation was therefore only 'palliative.'

During the following seven and a half years the patient casually attended at the hospital, taking small doses of nepenthe with glycerine from time to time. In December, 1893, for the first time two pin's-head nodules appeared near the left edge of the sternum. Previously all had been well. In May, 1894, the supraclavicular

glands enlarged, health declined; there were signs of visceral deposit. Death took place in 1895. There was no local recurrence to the end.

For brief notes of the treatment in various other instances, see original papers in *British Medical Journal*, September 19, 1896, and April 17, 1897.

A few other drugs of the Neurotic class also demand notice. Tonics are useless, if not injurious.

Antipyrine is often temporarily useful for cancer of the tongue and mouth, which, owing to the number of sensory nerves implicated, gives rise to excruciating neuralgic pains about the head and neck. Antipyrine lessens the doses of morphia required to obviate this.

Belladonna enhances the pain-subduing effects of morphia, lessens constipation, precludes salivation. Women bear much smaller doses than men.

The constipation inseparable from opium-administration in any shape is easily and best dealt with by enemata of 3-4 ounces Glycerine to as much warm peppermint-water, every third day. The excreta lodge in the rectum, whence they are easily dislodged mechanically.

Aperients by the mouth impair appetite, cause nausea, lower strength, and are so to be deprecated.

CHAPTER VII.

GENERAL PRINCIPLES OF OPERATIVE TREATMENT—THE MAMMA.

THE Auto-Infection of cancer is the *crux* of cure. When organs accessible to surgery have infected others, eradication is difficult or impossible. Before that stage, it is always practicable, and should be easy.

These auto-infective phenomena indicate four types of cancer in general :

(*a*) Cancer destitute of them, except in very rare instances ; *e.g.*, Rodent Ulcer.

(*b*) Cancer with Auto-infection of the adjoining Lymph-Glands only ; *e.g.*, Epithelioma.

(*c*) Cancer infecting first the Lymph-Glands ; and secondly, a little later, the Blood ; or, in case of the breast, the Bone-marrow ; *e.g.*, Carcinoma.

(*d*) Cancer primarily infecting the blood, and not intercepted by the Lymph-Glands at all ; *e.g.*, Sarcoma.

Each of these types involves distinct conditions of cure :

(*a*) Rodent Ulcer is easily eradicated beyond any possibility of return by purely local treatment.

(*b*) Epithelioma will always quickly 'recur,' unless the infected lymph-glands are removed with the primary disease. Granted efficient destruction of both these factors, the cure is a matter of course.

(*c*) Carcinoma is also permanently eradicated by the same measures before the infection has had time to reach the blood; or, with mammary cancer, the marrow.

(*d*) Sarcoma can be extirpated, before blood-infection, by removal of the whole tumour. It is useless for curative purposes to interfere with the lymph-glands.

The period of time within which a cure is feasible varies from four to five years in average Rodent Ulcer, to three months in Carcinoma, and six weeks in the more acute forms of Epithelioma. For cases in illustration, see *The Conditions of Radical Cure in Cancer*.

The universal panic fear of 'Cancer,' and general distrust of professional competency in connection therewith, appear largely due to the unscientific operations commonly performed upon the Mamma.

It is not too much to say that all surgical operations on this organ in the past were shams, and no more. They were founded on inadequate knowledge of the clinical course of the disease, and wholly disregarded its pathology.

In the current text-books of the student, the diagram of two elliptic incisions, which for the past century has served to indicate the *modus operandi*, still survives. That suffices

for instances of non-malignant disease; is fatally useless for cancer.

Without copious textural emendation, it inculcates partial removal of the organ; and very incomplete eradication of the disease.

The only alteration is a matter of fashion, rather than of improvement. The incisions are now longitudinal in place of transverse; parallel to the arm, rather than to the clavicle. Thus follows an unsightly and conspicuous scar, without more perfect extirpation. Whereas, whatever its demerits, the older plan produced an insignificant linear cicatrix parallel to the ribs, and hidden by the natural outlines.

Operations on the Mamma for cancer should rank in two classes—the Curative and the Palliative. The former are rarely possible after three months. The majority under existing circumstances necessarily fall within the latter.

A valid operation, when cure is feasible, demands regard to the following main points, among others of minor consequence:

1. The palpable tumour constitutes but a fractional part of the tissue actually diseased.
2. Even when this is a very insignificant 'lump,' the whole gland-tissue must be removed.
3. Not only the entire organ, but a wide tract of subcutaneous connective-tissue surrounding it on every side, will have become infected *per* the lymph-channels, and must be excised. Such a step adds nothing to the gravity, while immeasurably enhancing the efficacy, of the operation.

4. The axillary lymph-glands will be usually infected within six weeks by carcinoma of the outer two-thirds.

5. Carcinoma of the inner third, *i.e.*, at the sternal edge, does not infect the axillary until after the mediastinal glands and the residual thymus.

6. Every single case must be dealt with on its own merits, and requires the most careful consideration of operative details. No general formula applies to all.

In rendering local reappearance impossible, more turns on '*Wide removal of the subcutaneous tissue*' than on anything else. That very dangerous tract with its copious plexus of lymphatics and blood-vessels is the usual *nidus* of 'recurrent' nodules.

It is best dealt with on the common-sense principle of removing all that can be by any possibility infected. The chemical test proposed several years since in order to gauge the amount required for complete removal has not proved of practical value.

The second all-important measure of cure is *Removal of the Axillary Lymph-Glands before the stage of enlargement.* This applies, as above stated, only to disease of the outer two-thirds.

These glands are infected usually within six weeks, sometimes not for double that period. Enlargement does not ensue on the deposit of cancer-cells in the gland for two to three weeks.

In carcinoma of the inner third (sternal border) evacuation of the axilla is not to be advised as a routine measure. It does not enhance the prospects of cure, as the Thymus

and mediastinal glands are here infected first. It may, however, be necessary in palliative operations.

Another exception to the routine rule of axillary evacuation is presented by 'Atrophic' cancers, which constitute a small minority of mammary carcinomata.

The cases to which the term 'Atrophic' specially applies are furnished by small shrivelled mammæ of the male type. A carcinoma in the male breast is an apt example. These do not infect the lymph-glands for many months; it may be not for several years. Marrow-deposits are absent until very late, probably for that reason. It is uncertain whether a few do not wholly escape. Patients occasionally live for thirty years or more, and eventually die from some other malady.

Infection of the Bone-Marrow is the great difficulty which confronts the surgeon in mammary carcinoma. Once established, prolonged medicinal treatment is imperative.

It is the presence of this condition which most of all forbids severe and heroic operations in cases of advanced disease. Even one of the most short and trivial character will here commonly prove injurious, lowering vitality and accelerating the growth of deposit in other parts.

The first step in operating for cancer consists in dissecting off a healthy skin-covering at such a distance from the tumour that, on the one hand, all the infected portions be removed; on the other, that the edges can be subsequently sutured together without tension.

The first condition is all-essential, and in order to comply with it sundry modifications in detail may be

required. Sometimes it will be requisite to cut a single flap from the unaffected part of the breast, instead of the traditional two.

It is rarely impossible to fulfil the first of these conditions without also complying with the second. And as a general rule, if the second be plainly impossible, it is better not to operate at all, the body being then necessarily pervaded by distal deposits.

After carefully dissecting off the skin-covering upwards and downwards to the furthest limits of the mammary tissue, and, if possible, with a further inch of margin all around, the organ is removed from the underlying muscle, and turned outwards, while the axillary vein is exposed. The arm, previously held near the side, is now raised until nearly at right angles to the shoulder.

The removal of the pectoral fascia is necessary when the disease has approached or has become adherent to it. In recent or superficial cases, no advantage is thus conferred. If an error, however, take place, this will naturally be best on the side of safety.

Adhering muscle-fibres should be excised. It is rarely or never well to remove the pectoral muscles *in toto*. Should these be infiltrated, their ablation is useless in face of the visceral and marrow-deposits, which must of necessity co-exist.

The second stage of operation consists in exposing the axillary vein, and then of removing the contents of that cavity.

It is essential not to be content with a mere dissection from the line of that bloodvessel downwards. On the

upper surface of the vein, altogether out of sight, is a highly important lymph-gland, which, if the book-rule aforesaid be too slavishly followed, will escape.

This, at later stages of carcinoma, coalesces with another at the lower border of the vein (sometimes rather on its anterior surface), and completely blocks the large vessel, producing venous stasis.

Thus ensues the horrible condition of 'Brawny Œdema,' the arm in stout persons attaining enormous bulk, and involving extreme suffering.

Often the lymphatics are distended also by cancer-deposit, and become as solid cords. Those connected with the glands aforesaid combine with them to encircle the vein within a rigid ring of scirrhous growth.

The removal of these two lymph-glands wholly prevents the occurrence of brawny œdema subsequently, should the cancer 'recur.' Apart from the question of cure, it is thus of the utmost importance in 'Palliative' operations and every precaution should be taken to ensure it by careful exploration along the course of the vessel, above as well as below.

This unseen lymph-gland at the upper border is almost simultaneously infected with those within the axillary cavity. Its retention has prevented the ultimate success of many operations which would otherwise have proved curative.

Another condition, more readily noticed, and of like import, is furnished by the chain of minute hard nodules like pins' heads found in the fascia on the thoracic surface of the pectoralis minor, passing up towards the

clavicle. This in early stages of growth; later they are of course larger and more obvious.

These can be usually extracted with the finger-nail, without division of the muscles. Bidigital examination with one finger in the wound, another externally in the subclavian fossa, will ensure the complete removal of these minute foci of infection, due to growth at the lymphatic valves. Axillary evacuation is otherwise vain.

Further attention, in the course of that procedure, should be paid to the prolongation of breast-tissue, which normally passes into the axilla around the outer edge of the pectoralis.

This projection sometimes gives rise to 'Primary Scirrhous Carcinoma within the Axilla' (*Lancet*, March 12, 1898). The disease promptly involves the axillary vein, and may necessitate resection of that vessel.

The tumour appears to be widely distant from the mamma, which it is essential, however, to remove simultaneously. The event is rare.

It is seldom necessary to divide the pectoral muscles for the removal of the nodules aforesaid, or of the subclavian lymph-glands. Should that be unavoidable, the divided ends should be resutured with catgut.

Every feasible precaution to ensure primary union is imperative. Scientific asepsis, however, consists rather in attention to common-sense principles of cleanliness and of dryness, than in an indiscriminating worship of microbicides.

It is avowedly impossible wholly to exclude or utterly to destroy the omnipresent minute organisms, which lead

to suppuration. All we can effect in operation-wounds is to lessen the number of the microbes, weaken their potency, exclude the most dangerous, and provide a healthy soil unfavourable to development.

Nature unhampered will promptly kill the ordinary pyogenic microbes. Countless thousands gain access to the wound during an average operation, and are left there in a vital condition.

In this respect the behaviour of the perfectly fresh tissues, and those which are damaged or undergoing repair, presents a noteworthy contrast. An ordinary drainage-tube placed aseptic in a fresh wound is a salutary measure of precaution. But such a tube introduced or re-introduced into a wound after the first twenty-four hours have elapsed, no matter with what precautions of sepsis, will almost certainly bring suppuration in its train.

Dryness is a condition in the highest degree hostile to microbes, as its converse proves eminently favourable to their development. Hence the efficacy of dusting-powders in preventing suppuration. The value of Iodoform is out of all proportion to its ascertained germ-killing potency.

Any blood-clot within a wound is of course an apt *nidus* for microbic proliferation, though suppuration rarely follows under reasonable aseptic care.

Syringing operation-wounds is only necessary when there is internal sloughing. It is otherwise, no matter with what microbicide the fluid may be charged, a very reliable means of inducing suppuration, or of aggravating incipient tendency thereto.

Practical asepsis is best assured by the avoidance of water, or of watery solutions, in contact with the wound; by the prevention of subsequent hæmorrhage; by the free use of almost any non-poisonous moisture-absorbing powder to the skin-surface.

Loretin is the best and least objectionable of the microbicide dusting-powders in vogue for this purpose; is in every respect superior to iodoform.

Quick recovery from an operation is doubly necessary for cancer-patients in view of the nerve-conditions which commonly underlie that disease, and of the common need for immediate after-treatment.

In Mammary Cancer the maximum of benefit to be obtained from surgical measures is always compatible with primary union of the skin-wound.

In Palliative operations on more or less advanced cases this 'union by first intention' should be first assured, and promptly followed by Opium-Cocaine treatment.

The result is to induce factitiously that atrophic condition which is natural in the small minority; and which permits an indefinite period of comfortable existence.

Of things which should not be done, and yet which in recent years have been not only proposed, but actually carried out, amputation at the shoulder-joint, in order merely to obtain a flap for an extensive wound, is surely the strangest.

Not quite so astounding, but still not remotely distant from the same category, is the practice of so extensively

removing the skin that transplantation of grafts from other parts of the body is needed to replace it.

A third heroic measure is division of the clavicle in order to remove more freely the supraclavicular lymph-glands.

Surgical interference with these latter organs is to be deprecated. It in no way enhances the efficacy of an operation. Concurrently with enlargement thereof is always extensive deposit in the mediastinal glands. No benefit can thus accrue under any circumstances. The symptom is a late one, never seen under from one and a half to two years.

Patients subjected to such procedures are always in a very advanced stage of disease. Their marrow has long been infected. There must be extensive internal deposit in addition.

Removal of the Ovaries has been lately proposed for advanced cases of breast-cancer. It is not found to ameliorate, while fatal in some instances, followed by insanity in others. There is temporary diminution in the size of the œdematous arm.

As a general rule any local reappearance of Mammary Carcinoma within a shorter period than two years indicates an inefficient operation. Subsequently to that date the necessary consequences of prior marrow-infection must be reckoned with.

It is never permissible to excise both mammæ simultaneously or successively.

CHAPTER VIII.

THE PRINCIPLE OF 'ANTICIPATORY' GLAND-EXCISION—ITS IMPORTANCE IN OPERATIONS ON THE LIPS, TONGUE, MAMMA, SKIN, ETC.

NOWHERE else than in the Mamma have we Insidious Marrow-Infection to consider or fear. In all other respects the same principles govern cancer-surgery elsewhere.

Wherever Carcinoma or Epithelioma may occur, it is essential to remove, whenever possible, those lymph-glands which first receive the infective protoplasm, and bar its entrance into the blood, *before they have undergone increase in bulk.*

This is 'Anticipatory Gland-Excision,' a simple common-sense measure, adding nothing to the gravity of a surgical operation, while most materially enhancing its efficacy.

A radical cure is alone thus rendered possible in the more common instances of the more common forms of 'Cancer.' It was, and, unfortunately, too often still is, the custom to neglect the infected glands unless palpably enlarged.*

* So far as the writer is aware, the general principle of 'anticipatory' excision has not been promulgated by any other author, though the modern practice of axillary evacuation affords an approximation.

Enlargement is a relatively late stage of secondary cancer-deposit in lymph-glands. It is preceded by two others of :

(*a*) Insidious cell-growth without symptoms.
(*b*) Tenderness on pressure, without increase in bulk.

Each of the first two occupies a period varying from weeks to months, the minimum in the most acute forms being a fortnight.

For each local cancer-development the particular chain of lymph-glands infected (the 'infection-path') is constant, and the average time after which the presence of infection is assured is also, within certain limits, fixed.

Epithelioma of the Lips, of the anterior two-thirds of the Tongue, or regions of the Mouth adjoining either, first infects the *submaxillary* lymph-glands close to the anterior edge of the submaxillary salivary gland. Subsequently the *mylo-hyoid* in the mesial line. At a much later period the *cervical*.

Tongue - Epithelioma (a rapidly infectious form of cancer) attacks the lymph-glands within six weeks.

In Epithelioma of the Lips (much more chronic) secondary infection may be delayed six months. That, however, for really malignant cases, is the extreme limit.

The *submaxillary lymph-glands*, and with them the *mylo-hyoid*, are in the unenlarged state easily reached by a submental incision, down on the edge of the isonomous salivary gland, which acts as the guide for finding them. The former are usually three in number. After this incision care must be taken to examine the upper skin-

flap. When the glands are very small and the patient spare, one or more are apt to be drawn up with the skin over the bone, and so to escape notice. In thin persons they are intimately adherent to the skin.

The *mylo-hyoid* is normally hardly larger than a good-sized pin's head. It occurs in the mesial line, midway between the lower jaw and the hyoid bone, at the junction of the mylo-hyoid muscles.

The salivary submaxillary gland should never be removed unless there is direct infiltration by disease in the floor of the mouth.

Unilateral Epithelioma in the sites stated needs only unilateral removal. If central, or having extended to both sides of the middle line, both sets of glands demand excision.

Cancer of the Tongue in its posterior third follows the same time-rule as in the anterior portion. It first infects the *superficial cervical* lymph-glands midway between the angle of the lower jaw and the sterno-mastoid muscle. At the root of the organ Epithelioma attacks the *deep cervical* before or simultaneously with the superficial.

Both sets of cervical glands are extracted by an incision, as for ligature of the external carotid. In the actual tongue-excision it is important to remove not only the affected part, but also a wide tract of the contiguous mucous and submucous tissue, containing a copious plexus of lymphatics and bloodvessels from the floor of the mouth.

In order to secure this end, it will commonly be best to commence operation by threading the tongue, drawing

it well forward to one side, and then, with Paquelin's cautery, mapping out the tract in question. Without such a precaution the latter may escape.

For a superficial epithelioma on one side, only half the tongue will need removal by division of the median raphé; and with this, in most cases, the corresponding submaxillary lymph-glands on the same side.

It is necessary to be perfectly certain that the cancer is superficial and remote from the raphé, which presents no impediment to infiltration.

In consequence of the assertion by an eminent surgeon some thirty years since, that the median raphé acted as a barrier, many lives have probably been sacrificed by removal of half the organ, when that of the whole was indicated.

In such matters, viewing the gravity of the disease, everything should be left to the discretion of the experienced operator. Often only a small portion of the tongue at one side, or its anterior third, needs removal, when thus a sufficiently wide margin around the ulcer can be secured.

Commonly, under such circumstances, removal of the whole tongue would fail; whereas anticipatory excision of the small lymph-glands will readily effect a cure.

The fallacy that talking becomes impossible when the tongue is removed seriously influences the efficacy of cancer-operations. The error appears in a recent novel ('Under the Red Robe'). Friends always clamour for a limited operation.

Articulation is always, after the most radical extirpation, sufficiently good for the speech to be perfectly intelligible. There is a certain thickness at first, which may wholly disappear in time.

A man once appeared in the out-patient room whose face was unrecognised. He talked for several minutes without the smallest noticeable defect. It was only then discovered that his whole tongue had been removed for Epithelioma five years previously.

One of the miracles of the early Church (see Lecky's 'History of Rationalism') was that of the Ten Thousand Confessors of Africa, who lost their tongues in one of the frequent persecutions, and who yet could talk.

The phonograph has changed all previous views of the larynx, still more the tongue, as essential to articulation.

For excision of the whole tongue two gags should be introduced, the organ threaded, and removed with scissors. As the lingual arteries are approached, a long straight Wells' forceps is pushed in the middle line well into the muscular fibres, so as to compress both vessels. Subsequently silk ligatures, not catgut, secure obliteration of the tissue enclosed.

This method is preferable to that of first tying the lingual arteries in the neck, because of the great loss of time which the latter may involve when there is any abnormality of distribution. The artery can usually be found without any difficulty. On the other hand, I have known it give rise to prolonged and ultimately fruitless search by expert anatomists.

It is wisest to operate on the tongue before attacking the glands. The disease in the former is the chief evil, if not the only one, in the patient's view. If anything necessitate abandonment of the operation after only one of its two stages has been completed, the surgeon who has first attended to the glands will be in an awkward position.

I have seen this occur, and, though the usual custom is to make the tongue-operation the second stage, partly for reasons of anæsthetic convenience, partly in order that the lingual artery may first be tied, take leave to recommend the plan indicated.

The two primarily essential points in tongue-operations are:

(*a*) Avoidance of hæmorrhage;
(*b*) Rapidity.

The opposite conditions involve risk of pneumonia—septic, as all pneumonia is.

That despised instrument, the galvanic ecraseur, often renders palliative removal of a cancerous mass in an advanced stage feasible and safe. There is no hæmorrhage provided that the wire be used only at a moderate heat, so as to sever the tissues slowly. In such cases loss of blood would be commonly fatal, and any cutting operation is out of the question. Yet removal of the foul mass greatly relieves pain, permits the ingestion of food, and prolongs life.

Should the wire be overheated, so as to sever the parts quickly, there will be sharp bleeding at the time, and secondary hæmorrhage afterwards. Properly used, the

operation will be bloodless, and hardly ever followed by secondary hæmorrhage.

For cancer-operations on the interior of the cheek, with or without resection of the jaws, the measure of splitting the cheek and subsequently resuturing, affords access and ensures efficiency, without subsequent deformity.

Combined with the details aforesaid of an efficient *curative* operation, the precaution of 'Anticipatory gland-excision' may be relied on to prevent 'recurrence.' For cases see *West London Med. Chirurg. Journal*, July, 1897.

The DEEP CERVICAL lymph-glands are first infected by Cancer in the Pharynx or Tonsils, usually Epithelioma or Lympho-Carcinoma. Tonsillar tumours of the latter species are necessarily encapsuled, and demand enucleation.

The PAROTID lymph-glands by Epithelioma of the face in the orbital or temporal region. One of these is usually on the surface of the parotid salivary gland, the others embedded in its substance.

Surface lesions (Epithelial or Melanotic Epithelial) of the flexor aspect of the fore-arm infect the BRACHIAL glands above the elbow, the deep lymphatics passing directly to the axilla.

The SUPERFICIAL INGUINAL constitute the 'Infection-path' of Epithelial or Melanotic Epithelial Cancer on the reproductive organs of either sex, at the anal margin, on the skin of the foot or leg.

The SAPHENOUS lymph-glands around that aperture may occasionally be first infected by cancerous growth on

the foot or leg. They enlarge promptly *after* the preceding in lesions of the scrotum, vulva, perineum, etc.

In Melanotic Epithelial Cancer of the lower limb implication of the glands takes place within a very few weeks of inception, at the utmost six. Thence the particles pass quickly into the blood-current. The lymph-glands here present only a temporary barrier to general diffusion.

On the other hand, the auto-infective phenomena of ordinary epithelioma on the lower extremities or sexual region is peculiarly slow. No enlargement of glands may appear for a year.

With the virulent Melanotic disease, no time should therefore be lost in anticipatory excision. With Epithelioma, a slight enlargement may be awaited before the glands are removed, especially in view of the liability of the groin to septic contamination.

CHAPTER IX.

UTERINE CANCER, WITH SPECIAL REFERENCE TO ITS TREATMENT BY POTASSA FUSA.

UTERINE cancer is very seldom now recognised until far advanced and ineradicable. This is largely because no one anticipates it, unless there is 'cancer in the family,' a rare event in the cases ordinarily met with.

Prompt diagnosis is best attained by recognition of the *a priori* conditions leading to this very prevalent disease, by being 'on the look-out' for cancer in a person likely to become its victim. It is dangerous to treat symptoms of uterine derangement in the thin, careworn, anxious-looking woman who is the typical subject of uterine carcinoma, without careful investigation of their cause.

The exciting causes which immediately precede carcinoma elsewhere are *trouble, worry, exhausting toil, loss of sleep*. To these must here be added *recent parturition, with neglect of the needful subsequent recumbency*.

Cancer of the Uterine Cervix is by far the more prevalent form. It may be either Carcinoma from the branching tubular glands, or Epithelioma from the vaginal mucous membrane.

Diagnosed within six weeks, a radical cure may be usually guaranteed without resort to any cutting operation at all, or to one of only trivial character.

Subsequently to that date, whatever the means adopted, permanent recovery is usually precluded by the copious lymphatic plexus in the vaginal *submucosa*, communicating with the lymph-vessels of the broad ligaments, and the lymph-glands within the pelvis.

Given the first condition, cervical cancer can be readily extirpated either by the **Potassa Fusa**, or by a supra-vaginal amputation of the cervix carried as high as the *os internum*.

The essential point, whichever method be adopted, is the destruction of the *mucosa* and *submucosa* of the cervical canal to the point stated.

By the powerful caustic in question, all the diseased tract can be safely extirpated, and the prospects of subsequent immunity will be as good as after the most complete Hysterectomy.

Total Hysterectomy for cervical cancer is very seldom indicated, for the reasons following:

1. The 'Infection-path,' the vaginal *submucosa*, with its copious lymphatic plexus, is the dangerous part in view of after-recurrence. This is not removed by hysterectomy.
2. Much risk attends the operation in the most expert hands, ligature of ureters the chief, septicæmia next. Unless there be a prospect of cure, which is impossible when the submucosa is infected, it is unfair to expose the patient to these dangers.

3. The body of the uterus is often found entirely free from cancer-infiltration when the disease has been allowed to run its natural course unchecked.

Hysterectomy signifies, therefore, the removal of a large tract of healthy tissue, which is never implicated until a late stage of the malady, and which frequently escapes altogether—at the cost of a peritoneal opening, with its attendant risks.

4. Equally good results follow other methods, not involving danger in any shape.

Vaginal Hysterectomy is, on the other hand, the only remedy for cancer within the *body* of the uterus, a lesion far less common than the preceding, and not occurring in more than 10 per cent. of the total cases.

This, even at a late period—a year or more—of the disease, is permanently successful, because:

1. The cancer grows on a free surface, and is practically encapsuled by the resisting muscle-walls. Both conditions are eminently unfavourable to the diffusion of infective particles.
2. Secondary deposit rarely occurs for at least a year from inception.

It has been pointed out by Dr. Lewers, with whose experience the writer's coincides, that total hysterectomy for cervical cancer is always followed by 'recurrence' in six months; unless in the early stage, when supravaginal amputation would suffice (*Lancet*, July 6, 1895).

The only real advantage gained by Vaginal Hysterectomy for cervical cancer is that it ensures complete

destruction of the cervical mucous and submucous tissue throughout the canal; part of which, at the hands of a timid operator, might escape.

In the most expert hands the operation involves great risk of ureter-inclusion by ligatures, for in dealing with cancer it is plainly impossible always to avoid that structure by the book-rule of tying close to the cervix.

Should both ureters be included in a permanent ligature, such as silk, the result will be necessarily fatal. If only one, the patient recovers with a ureteral fistula.

The only means of rendering harmless, in either vaginal or abdominal operations, this accident is to employ for the ligatures some material such as catgut, which can be relied on to become loose within a few hours, and to undergo subsequent absorption.

For the safe use of Potassa Fusa the patient must be anæsthetized, a duck-billed speculum introduced, and the cervix firmly held by one or more vulsella introduced laterally. Two sponges soaked in water are compressed against the posterior vaginal wall by the blade of the speculum. Sticks of the caustic held in a uterine holder are passed well within the cervix, and rotated slowly until dissolved. Several sticks are successively introduced until all the cancerous deposit is destroyed. Finally, a copious irrigation with plain water finishes the sitting.

It is essential to fix the cervix with vulsella, and ensure right direction, otherwise the fornices may be pierced. With that precaution there is no fear of perforation. The

uterine muscle-walls present strong resistance to the action of the escharotic.

In case of doubt as to the efficient destruction of the cancer-deposit, it is well to syringe with water, and then digitally explore, renewing the caustic application when necessary.

The vaginal wall must always be carefully protected by sponges soaked in water.

Potassa Fusa possesses over all other caustics the inestimable advantage that its action, and therewith all pain, *ceases instantaneously on contact with water.*

On the other hand, the subsequent pain and shock involved by uterine applications of Zinc-Chloride are very great. It is impossible immediately to terminate the destructive process. There is often much suffering for days.

The actual cautery has too superficial an action to be of more than occasional value.

One advantage in the use of caustic potash to the uterine cervix is the absence of bleeding to any appreciable extent. Another, as contrasted with other caustics and methods, is that we have an instrument which readily obeys our hand.

The common practice of **scraping** cancerous growths in this part is to be deprecated. It involves free bleeding, some shock, and liability to subsequent sepsis. There is an appreciable mortality directly due to the measure.

Even in advanced cases Potassa Fusa effects much good, and is preferable. It can be safely invoked when

the uterus is fixed and cutting operations out of the question. The measure should be promptly followed up by Opium-Cocaine treatment.

Crystallized Iron-Perchloride, which can be used without anæsthesia, forms a useful prelude to Potassa Fusa in cases of Papilloma Uteri, the true 'Cauliflower Excrescence.' The vagina is found wholly or partially filled by a soft pulpy mass, which bleeds profusely at the slightest touch.

It is impossible, on account of the bleeding, to deal with this complaint in the ordinary way without risk. One or two crystals of Iron-Perchloride pushed up to the cervix, and retained by cotton-wool pads soaked in oil, promptly mummify and efface the vascular vegetations.

If there be then infiltration of the cervix, as is usually the case, the remainder of the cancerous deposit can be safely extirpated by Potassa Fusa.

Here, as in the Bladder, Tongue, and other regions, a 'Papilloma' is either an actual or a potential 'cancer,' most often the former.

The only difference, a very fragile and variable one, between the so-called 'Papillomata' and Carcinoma or Epithelioma in the same situation is that in the former the cell-clusters are pedunculated. Sooner or later, however, the base is also infiltrated, and then there is no appreciable clinical distinction between the former and the latter. In the majority of instances a 'Papilloma' is a true cancer from the beginning.

Everywhere chronic congestive conditions of a mucous tract lead up to cancer; hence there can be no doubt that the common 'ulceration of the womb,' or granular

erosion, is a fruitful source of uterine cervical cancer; that the latter might often have been precluded by timely treatment of the former.

Prophylaxis, however, is most obviously attainable in relatively young women during the parturient epoch; by confinement to bed in the multiparous long after the traditional nine days.

A miscarriage is even more dangerous than a birth at full time, and should involve more protracted recumbency.

The recent rather copious literature upon 'Deciduoma Malignum' hardly amounts to more than an expression of two long-familiar facts:

(*a*) That malignancy often follows neglected parturition or miscarriage.

(*b*) That cancer is apt to arise wherever cell-growth is active.

CHAPTER X.

THE RECTUM, STOMACH, ETC.

THE remarkably insidious appearance of many **rectal cancers** has been referred to.

The special difficulty in surgical eradication is the tendency to secondary deposits in the Liver.

Examination of that organ is requisite before operative interference is attempted. The presence of metastases wholly negatives operation, however mobile the cancer may be. These grow in the liver far more rapidly than the primary cancer, and prove fatal within a few months.

Total excision of the lower 4 to 5 inches will be effected by a circular incision around the sphincter ani. There is no advantage in a median division of the sphincter towards the coccyx.

Partial excision is a little more difficult, and also more hazardous, than the complete. It is indicated by small local cancer-deposit, not implicating the entire circumference. A semilunar incision external to the sphincter is preferable to the median coccygeal; thus the muscle remains intact, and contamination by the fæces is largely avoided. The diseased spot is more easily isolated, and hæmorrhage better under control.

Thus freed on one side, the bowel is incised laterally, and the cancerous ulcer removed by the aid of the finger passed within. Subsequently the continuity of the bowel should be restored by careful suturing, and the sphincter forcibly dilated.

The difficulty of partial excision, especially with deposit high up the bowel, is chiefly involved by hæmorrhage in a deep cavity concealed from view. Even when there is no trouble at the time of operation, the patient is apt to bleed profusely when removed to bed.

After restoring the continuity of the intestine, it is well to plug the deep wound with iodoform gauze, which, beside precluding hæmorrhage, acts also as a drain; subsequently to suture the skin wound, and to remove the gauze after twenty-four hours.

The patient should be fed by pre-digested foods, moderate doses of opium administered, and after a week the bowels evacuated by a copious glycerine enema.

Very severe and exhaustive operations for high rectal cancer are in vogue, such as Kraske's, involving division of the sacrum as high as its third segment. They are often immediately fatal, from the profuse hæmorrhage.

The bone should be only partially sawn through, division being completed with the bone-forceps. Inattention to this precaution involves section of the middle sacral and other vessels, which promptly retract beyond reach.

When the deposit is **fixed**, operations with division of the bone are useless; as periosteal infiltration of the pelvic bones, to say nothing of the lymph-glands and

liver, ensures immediate return. When it is yet mobile, the growth can usually be dealt with on a much safer plan.

The patient being placed in the lithotomy position, the surgeon cuts down on the seat of disease with careful traction. Then a lateral incision into the bowel will admit the left index-finger, which hooks down the deposit and brings this within reach. Vulsella would tear through. The tip of the finger is then cut down upon as a guide. Thus the healthy tissue is divided in such a manner as to ensure a sufficient margin around the palpable disease.

The ultimate tendency of all rectal cancerous infiltration, whether hard or soft, is towards dilatation of the lumen, not contraction. The last stage of the disease is clinically exhibited as a rigid tube, some three or four times as wide as the normal canal.

Hence it is wrong to hold forth the bugbear of obstruction as an inducement to undergo some non-curative operation, generally inguinal colotomy.

Ordinarily, no intestinal obstruction need be feared except as the result of neglect, or in the Papillomatous form. The cases in which Colotomy is advisable are few.

The operation seldom does anything to prolong life or arrest growth. The natural chronicity of the disease should be borne in mind before any non-curative operation is resorted to. Often the cancer will not kill for ten or twelve years.

The mental suffering and social disability entailed by colotomy operations indicate their avoidance except in the last resort.

There is more risk of obstruction when polypoid (papillomatous) masses project into the intestine, than in the more common infiltrating forms.

When **Colotomy** is indeed unavoidable, the old lumbar operation, now very irrationally neglected, is generally preferable. Its chief advantage lies in the fact that it secures an opening into the bowel at the junction of the transverse and descending colon; thus high up, and well above the disease.

Lumbar Colotomy involves no peritoneal risk, such as often proves fatal to the patients after the Inguinal operation. If care be taken well to drag down the intestine before suturing, and thus ensure a good 'spur,' the relief afforded is perfect. Lastly, an opening in the flank is more sightly and more convenient in many ways than one in front.

Contrasted with Inguinal Colotomy, the old lumbar operation confers a gain of about 2 inches in distance above the seat of disease—no inconsiderable advantage.

Inguinal Colotomy is, as a general rule, to be deprecated because:

1. The opening is made in the sigmoid flexure; thus too low down, and often close to the diseased area. This means a probability of septic peritonitis. The exposed meso-colon not uncommonly shows hypostatic congestion.

2. The peritoneum is freely opened, and no septic precaution can always avert peritonitis under the conditions stated.

3. The patient is commonly already exhausted by long-standing disease.

I have known many deaths from Inguinal Colotomy; some in persons who would otherwise have apparently lived for many years. I have never heard of or seen one from the Lumbar operation.

An all-inclusive table of mortality statistics would go far to deprive Inguinal Colotomy of the vogue it has unfortunately acquired.

Resection of other parts of the Intestine is rarely possible on account of previous lymph-gland deposits. The same with the Pylorus. With earlier recognition that obstacle would of course be non-existent.

In technique, operations on the intestine have by no means reached final perfection. For resection, the decalcified bobbins of Mayo Robson and others present the highest standard of safety combined with celerity, attained so far. The metal button of Murphy involves a highly dangerous tissue-necrosis.

For Gastrostomy, the ingenious procedure devised by Mr. Jessett can hardly be excelled in point of simplicity, rapidity, or freedom from risk.

It is doubtful whether any of the other palliative operations on the Stomach, such as gastro-enterostomy, confer benefit comparable to that attained by Opium-Cocaine treatment, combined with the administration of Lymph-gland extract.

They seem to be founded on an erroneous principle. For it is impossible to admit that the vomiting, which is so marked a physical sign of cancer in the stomach, is always, or even often, due to obstruction at the pyloric orifice.

Primary Cancer of the Liver is almost unknown; it is even doubtful whether such a lesion occurs. Most of the cases so styled are really carcinomata of the gall-bladder. With early diagnosis, extirpation of the latter is of course perfectly feasible.

The remainder are either metastases from distant parts, notably the mamma; or else direct infiltrations by cancer in the pancreas, stomach, abdominal lymph-glands, etc.

Any malignant tumour within the Liver-tissue must, with very rare exceptions, be a Secondary deposit, and so beyond the domain of rational surgery.

CHAPTER XI.

THE BONES, THE OVARIES, ETC.— LAPAROTOMY.

MALIGNANT growths of bone are often found in the young, a conspicuous exception to the cancer-rule everywhere else. The great majority are **Periosteal Sarcomata**, derived from the osteo-genetic layer of that membrane. A minority of Lympho-Carcinomata arise in the Marrow.

When the former species attacks a long bone, it is essential to recognise the disease before it has approached the medullary canal, along which diffusion takes place rapidly. Then isolated nodules are found scattered throughout the included marrow, or all the latter may be converted into a solid rod of Sarcoma-tissue.

Moreover, general blood infection then quickly follows. Cases of latency in the marrow are rare; but have been occasionally noticed (*Treatise*).

The blood-infection involves visceral and other metastases. A noteworthy feature is the peculiar preference (originally pointed out by Sir J. Paget) of the sarcoma-protoplasm for a similar soil elsewhere.

So with great rapidity appear very numerous tumours on many bones. The condition has been erroneously

described as 'Multiple Primary Sarcomatosis,' but is always due to blood-infection from a single primary growth.

Sarcomata of flat bones do not commonly show so conspicuous a tendency to rapid blood-infection as the long.

Amputation for sarcoma through the shaft of a long bone is rarely successful. Reappearance almost invariably follows within a few weeks. Many youthful lives have thus been sacrificed.

If any operation be performed, it is imperative to remove the whole by amputating through the proximal articulation.

This will prove curative provided the blood has not been previously contaminated.

On the other hand, it is not nearly so essential to remove the whole of a bone without a central medulla, provided that a sufficient margin can be otherwise secured.

The protection of the central medulla from mechanical violence accounts for the rarity of true 'Central' tumours of bone. Such are, however, more dangerous than the periosteal, and demand more prompt surgical treatment.

The long bones most liable to sarcoma are, first, the femur in its lower third; next, the humerus, in its upper; thirdly, the proximal end of the tibia and fibula. The cause is nearly always a blow.

Any tumour here developed after violence will almost certainly prove malignant. It is noteworthy that the injury

is usually a trivial one, not necessitating confinement to bed. The point is suggestive, in view of prophylaxis.

Sarcomata of the Jaws display the general tendency of congestive conditions to involve cancer-development, and so might usually have been obviated by a dentist's supervision.

Numerous so-called **Ovarian Cysts** are true cancers, owning the same causes as malignant disease elsewhere; occurring in the cancer-age; ultimately producing Auto-infection with Metastases.

Thus, of 600 ovariotomies in Schroeder's clinique, 100 were found obviously cancerous at the operation; and only 19·5 remained free from 'recurrence' more than a year. Leopold found that 20 in 110 completed ovariotomies showed malignant growths, while 6 others were not completed for the same reason (22·4 per cent.). Olshausen encountered malignant disease 21 times out of 293.

According to the late Professor Greig Smith, 1 in 10 ovarian tumours are dermoids—*i.e.*, growths from embryonic residua (Wolffian body)—and prone to merge into Blastoma. All the ovarian cysts or solid tumours of early life must be classed with the latter.

The tendency of ruptured ovarian cysts, with intra-cystic vegetations, to produce multiple grafts on the peritoneum is well known.

For special examples of this Auto-Inoculation process, together with the still more striking phenomenon of distal metastases in the viscera, see p. 353, *Treatise*.

There is considerable analogy between Cystic Ovarian disease and the like condition of the Mammæ. In both

the cysts are almost invariably multiple, but one exceeds in size the rest. The organs on both sides are commonly affected, simultaneously or successively. Both in the ovaries and the mammæ the cysts may remain long non-malignant, but are apt eventually to develop truly cancerous vegetations. The cysts are originally lined by columnar epithelium.

The ovaries are prone both to Sarcoma (probably really Myo-Sarcoma ?) and to Carcinoma. The first is much the more frequent, is more localized than the latter, and presents more favourable prospects of cure.

The Fallopian tubes are liable to Carcinoma developed in the papillomatous form. At an operation both are almost always found diseased, the growth on one side being larger and in a more advanced stage than that on the other. This condition denotes the necessity of removing the appendages on both sides for tubal papilloma, however early. Fœtal residua are often, if not always, in question, as indicated by Von Recklinghausen.

The abundant embryonic remains of the broad ligament (parovarium, hydatid of Morgagni, duct of Gärtner, and other relics of the Wolffian body) are a fertile source of both the simple broad-ligament cyst and of malignant tumours, which pass through a career parallel to that of ordinary cancer.

All cancerous growths about the ovaries of the young appear to be Blastomata. In practice the differentiation of the congenital group seems now unimportant. No one, however, can gauge the possible improvements which would follow scientific research in this almost untrodden field.

Laparotomy-operations for malignant lesions need no special rules. Final success is, of course, dependent on early diagnosis, which, as in cancer elsewhere, is more favoured by appreciation of the *a priori* conditions than by any implicitly reliable symptom.

Exploratory Laparotomy for suspected cancer is not only important in diagnosis, but also of high value in point of treatment.

Occasionally, with every sign of malignancy, the surgeon is rewarded by finding some much less grave and perhaps remediable condition.

In **cancerous peritoneal deposit**, that membrane is stimulated to more healthy function by sponging, with the usual other details. Sometimes the ascites which would otherwise necessarily follow is almost entirely prevented. The result is analogous to the cure of tubercular mischief, which follows a merely partial removal of the tubercle-granulations.

In Ascites from cancer a much longer period elapses before the cavity refills, than after a simple tapping. Recently a lady, who for many months had required the latter every fortnight, did not again suffer for nearly three months.

Numerous instances are now on record in which an abdominal growth presenting every appearance of 'cancer' has disappeared after a simple peritoneal incision. (See p. 102; and *British Gynæcological Journal*, August, 1897.)

CHAPTER XII.

CAUSTICS AND THEIR SCOPE—LUPUS.

WHILE **chemical escharotics** are eminently adapted for the treatment of 'Cancer' in its more local and superficial forms, their employment in the rest is no more than a barbarous pretence by the unscrupulous or ignorant.

It is the Auto-Infective phenomena of cancer which emphatically bar its use for Mammary Carcinoma and for most other prevalent lesions.

In Cancer of the Mamma, caustic applications involve great suffering, with rarely any possibility of benefit. The secondary deposits in axillary glands must perforce remain untouched, and these are seldom absent when advice is sought. Only a very few exceptional 'Atrophic' Mammary Cancers can be thus radically extirpated.

Foremost among the species curable by escharotics is true Rodent Ulcer, with which rank the chronic Epitheliomata of the same region—the face, cheek, eyelids.

Provided that the periosteum of the underlying bones is unimplicated, an event which seldom occurs for five years or more in Rodent Ulcer, permanent eradication is easily secured by Potassa Fusa without resort to the dreaded 'knife.'

When, however, the bone is invaded, nothing short of wide removal will suffice, and caustics are useless.

The prevalent Uterine Cervical Cancer is advantageously treated by escharotics.

A huge number of caustic recipes have been promulgated for cancer-treatment, and are still occasionally brought forward. They are rarely other than slightly varied mixtures of very familiar weapons.

The Vienna paste was caustic potash with quicklime. Manec's consisted of arsenic, cinnabar, and burnt sponge; Canquoin's, of zinc-chloride with flour; Bougard's, of arsenic, cinnabar, zinc-chloride, corrosive sublimate, sal-ammoniac, starch, wheat-flour, and a colouring agent.

Most of these concoctions are worthy only of a torture-chamber. Bromine, chloride of gold, terchloride of antimony, nitric, hydrochloric, and sulphuric acids have also been employed.

The 'Cancer Cures,' which according to newspaper paragraphs are from time to time discovered in various parts of the world, and with letters whereon the Cancer Hospital is continually inundated, have so far proved to be agents well known already (the majority); or substances perfectly inert; or very mild caustics of vegetable origin, principally the acrid juice of various *Euphorbiaceæ*.

For practical purposes the list of useful caustics may be reduced to the following simple chemicals. No advantage is gained by blending.

1. Potassa Fusa.
2. Zinc-Chloride.
3. Strong Sulphuric Acid.
4. Iron-Perchloride.
5. Arsenious Acid (Arsenic).

The Ideal Caustic is that Potassa Fusa already referred to in connection with uterine cancer. It acts rapidly and energetically by virtue of affinity for the water of the tissues, while kept under easy control by means of the same chemical law. All burning action, and therewith all pain, cease instantaneously on contact with water. Arsenic is liable to absorption by a mucous membrane, and so dangerous.

Zinc-chloride is efficient, but barbarous. Acting powerfully, it is very painful. The destructive action cannot be immediately terminated as with the potash salt. Severe suffering continues for many hours afterwards.

Sulphuric acid, mixed with charcoal, asbestos, saffron or lycopodium, may be legitimately applied to a fungous bleeding mass on a flat surface. Elsewhere it is apt to run. It promptly chars without hæmorrhage, and can thus sometimes be resorted to when it is impossible to place the patient under anæsthesia.

Paquelin's Thermo-cautery can only be appropriately used, in cancer-treatment, as a cutting instrument to sever vascular parts. Otherwise its action is too superficial to be of use. It must be employed at a very moderate heat, or there will be hæmorrhage, both primary and secondary.

For the same reason, it cannot be relied on in the treatment of **Lupus.** All cases so dealt with quickly recur, because the tiny pellets of cell-growth which stretch away into the healthy skin around the patch are not eradicated.

The clinical phenomena of Lupus resemble those of cancer in progressive cell-erosion, but differ in the

absence of auto-infection. Many cases, however, are propagated by auto-inoculation. This similarity has led to habitual treatment of the former at the Cancer Hospital.

In the great majority of instances, I regard Lupus as only another name for Syphilis—generally inherited, occasionally acquired. Not only do its symptoms closely correspond with those of accredited examples of the latter; not only do we frequently find fairly certain evidence of syphilis; but lupus-patients conspicuously show that defective repair of tissue after injury which is the special badge of the syphilized.

In the minority, particularly in Lupus Erythematosus, there is no such correspondence, and the relationship can be inferred only as a matter of probability.

The identity is most striking in cases of Lupus attacking the nasal fossæ, eroding the bones and palate with profuse ozæna.

I cannot help considering the scanty tubercle-bacilli, sometimes found with difficulty, as a consequence, not a cause; and as accidentally implanted. Most of the patients habitually live in an atmosphere surcharged with microbes, tubercular among the rest. The soil is well prepared for their reception.*

* Without such preparation of the soil, the tubercle-bacillus is apparently inert. Pulmonary phthisis is nearly always preceded by a slight catarrhal pneumonia, a so-called 'feverish cold,' which is ranked with an ordinary catarrh, and excites no more notice. Consolidation at an apex will be found if looked for. Within this the microbe is implanted, and the ordinary symptoms of consumption follow in a few weeks.

Both Paquelin's cautery and Silver-Nitrate are too superficial in action to be of valid use. After either the disease promptly returns; as after a simple 'scraping,' no matter what instrument be used.

A better plan is to apply Iron-lint (lint soaked in strong iron-perchloride solution and dried) to the raw surface after scraping. This cures, but is apt to leave a thick, unsightly scar. The plan is useful, however, for the nasal cavity.*

The best method is, after complete erosion, to apply lint soaked in Linimentum Iodi to the raw surface. This effectually destroys all minute cell-collections left behind, with a natural scar. Morphia is temporarily required.

I have met with cases of Lupus which had been scraped fifty to sixty times, and others almost as often plunged into the factitious septicæmia of Koch's Tuberculine. A single sitting on the above plan seldom fails to cure.

* Nasal polypi are effectually prevented from returning by well-plugging the nares with Iron-lint after evulsion. The method is preferable to any other of which I have experience. Simple evulsion rarely succeeds. It is necessary to leave a healthy mucous membrane behind.

CHAPTER XIII.

ELECTRICITY.

ELECTRICITY, *as such*, modifies to a certain extent nerve-function, but has no influence whatever upon nutrition.

The interrupted current improves (indirectly) the nutrition of paralyzed muscles, by causing their fibres to contract.

A weak continuous current materially assuages the neuralgic pains of cancer, particularly when ulcerated. For this purpose it might well be employed more often than is now the case.

These pains are aggravated by interrupting the current.

Unless strong enough to **burn**, no current, whether continuous or interrupted, has appreciable effect upon the nutrition or growth of any cancer or tumour.

This has been proved by innumerable trials of electricity, with infinite modifications in detail, throughout more than a hundred years.

Needles passed into the tissues for purposes of electrolysis simply produce a slough at each pole, *i.e.*, when a current of any appreciable strength is employed. No difference is apparent in the slough at either pole.

When it is desired thus to burn a small portion of tissue, as with nævi or misplaced hair-follicles, electrolysis is serviceable purely and simply as a form of the actual cautery.

In malignant deposits there is every probability that the ulcers which follow separation of the dead tissue will never heal, and will fungate.

After a brief application of a weak continuous current, a patient suffering severely from ulcerated cancer, of the breast for example, will commonly remain perfectly easy and comfortable for two or three days. This practically sums up the direct therapeutic uses of electricity in cancer.

Indirectly the force furnishes some useful modifications of the actual cautery. The electric cautery is hardly so serviceable as the Thermo-Cautery of Paquelin, because it cannot be employed as a severing instrument.

The galvanic écraseur will effect the palliative removal of malignant tissue without hæmorrhage, or risk of septicæmia, and when general conditions forbid resort to the usual methods of surgical interference.

Almost any bleeding fungous mass of cancer-growth may be advantageously dealt with on this principle when there is no failure of bodily strength. Thus complete alleviation of the more distressing symptoms, the patient being placed in a favourable condition for Opium-Cocaine treatment.

The wound produced by separation of the eschar will probably heal. For while **cutting** through a cancerous

infiltration always accelerates growth, on the other hand, *burning* invariably checks this very materially.

Excision with the knife of an advanced carcinomatous mass is thus quickly followed by exuberant fungous growth. *Per contra*, removal by the cautery produces a wound which tends to contract, and never to fungate.

Under circumstances likely to involve septicæmia, the eschar of a cautery usefully serves to seal up the absorbents, during the period of danger, the first two or three days.

Of secondary hæmorrhage at the separation of the eschar (after the galvanic écraseur, etc.), there is little risk, provided that the instrument be used at a temperature just sufficient to ensure very gradual division of the tissues. A very hot wire and its rapid action necessarily involve free hæmorrhage at the time and subsequently.

CHAPTER XIV.

HYGIENE—LOCAL TREATMENT.

No particular food, no climate, no condition of soil or of water-supply, has any influence on the development or course of cancer.

Vegetarians are no less liable than those who consume abundantly animal food, total abstainers than those who moderately indulge in alcohol, Jews than Gentiles. Only the poor, with their heavier burden of cares, are very largely more prone than the rich.

A spare habit of body conduces to the slow growth of cancer, and *vice versâ*. Stout, plethoric people are the most unfavourable subjects. In these local increase is rapid, auto-infection early, the mass large, the symptoms generally more painful and pronounced. With the thin the reverse is the case as an average rule.

It is thus an error to prescribe tonics for the purpose of increasing appetite, or, indeed, with any other view. They may not work appreciable harm, but assuredly cannot do good.

On the other hand, the tendency of Opium to reduce corpulence concurs with its other good effects in arresting cancer-growth and prolonging life.

An individual so afflicted will best model his life on that of the plant, so far as may be possible. The more passive and vegetative the mode of living under such a burden, the slower will be the advance, the more potent and patent the influence of drugs.

It would be interesting to learn how or why popular suspicion has attached itself to the Tomato as provocative of cancer. No explanation of this curious and wholly baseless notion has yet appeared.

For **non-ulcerated cancer** of external parts strong lead lotion is the most serviceable application, allaying local congestion. The strength should be an ounce of Liquor Plumbi Subacetatis to the pint of water, which need not be distilled. The lotion is to be dabbed on the unbroken skin with a sponge and allowed to dry.

There is no advantage in adding to this laudanum, which is not absorbed. The part should not be bandaged. Anything tending towards local heat is prejudicial.

Any crust or scab on the surface should be promptly removed by an emollient poultice before local treatment can be brought to bear.

The most universally serviceable application to an ulcer is Menthol dissolved in olive-oil (½ drachm or 1 drachm to the ounce). Not only a powerful deodorant and antiseptic, it also numbs the sensory nerves.

For the mouth oil of almonds is more palatable as a solvent of Menthol.

A lotion of Cocaine Hydrochlorate (½ grain dissolved in the ounce of water) destroys odour as well as local

sensibility, and may also be used for a continuous dressing.

For **ulcers**, shallow and superficial, on the skin, an ointment of Eucalyptus-Oil, 1 drachm; Iodoform, ½ drachm; Lanoline, Benzoated Lard, of each 1 ounce.

For specially fetid **mouth-sores** β-Naphthol, 5 grains in an ounce of mucilage.

For foul and sloughing **external ulcers** Loretin freely dusted over the part has proved the most efficient deodorant I have ever used, as well as the most useful aseptic for operation-wounds.

Vomiting, from whatever cause, is best controlled by Cocaine, ½ grain, in pill. Also by the same in Champagne; by small doses of Chloral Hydrate; by carbonic acid, in effervescing mixtures; by β-Naphthol, 5 grains, administered in milk.

For **hæmorrhage** from a sore, Iron-lint (lint steeped in strong Liquor Ferri Perchloridi and dried); small pieces to be applied to the bleeding points, and left in contact.

The best vaginal injection for **Uterine Cancer** is Silver-Nitrate (10 grains to the ounce). Next to this Chloralum, 1 in 20; also Naphthol (10 grains to the ounce.)

For **Mouth-washes** or Gargles, Chloralum, 1 in 40; Carbolic acid with peppermint, 1 in 60; Cocaine Hydrochlorate, ½ grain to the ounce. After operations on the mouth, Boroglyceride with peppermint-water, 7 per cent.

For **Brawny Œdema of the Arm** immersion of the limb as high as the shoulder in an arm-bath of hot water

twice daily. In the interval, strong lead lotion on lint, under gutta-percha tissue. Martin's india-rubber bandage may be worn during the day, removed at night. As a rule, the ordinary 'water-dressing' bandage is more comfortable, however. A few leeches from time to time greatly alleviate. Massage and the galvanic current are sometimes useful.

This painful state, most marked in the stout, is one of the most intractable conditions with which, in breast-cancer, the surgeon is called on to deal. His comparative powerlessness to assuage emphasizes the necessity of careful prevention by the measure described at p. 112.

Vaseline is an improper and sometimes harmful basis for ointments, being adapted only for metal-work and machinery. It may excite a rash. It always hinders such absorption as may be possible and desirable.

Innumerable **dietetic preparations** are of service in long-standing cases. Wines containing Cocaine, especially the Champagnes, come foremost. Every wine-merchant and almost every grocer now sells some form of Coca-wine, a point which should surely attract the attention of the Legislature.

Coca is a nerve-stimulant (like tea, coffee, and alcohol), not a tonic. Undue stimulation involves corresponding reaction, with organic disease in the end. The drug should be reserved for grave maladies treated under medical direction. Its increasing use as a habitual article of diet must lead to serious harm, and should be restricted by law.

Presumably the harm is to a certain extent lessened by the introduction of only a fractional percentage of Coca or of Cocaine; that, again, is a drawback for the practitioner. All these preparations should be standardized, and dispensed only under medical prescription. At present their strength, even if publicly announced, which is seldom the case, may be indefinitely varied from day to day, at the option of the vendor.

No fœtor and no pain should ever be tolerated in cancer, ulcerated or otherwise.

CHAPTER XV.

MAMMARY CANCER: ITS SYMPTOMS AND COURSE.

THE prevalent '**cancer of the breast**' is Carcinoma, the chronic form being termed 'Scirrhus,' and the acute 'Encephaloid.' Its cause, as already stated, is 'anything which impedes or arrests the natural process of Devolution,' chiefly mental distress. Heredity has no appreciable influence in predisposition. It always owns a direct excitant.

The age of Devolution, *i.e.*, permanent degeneration, is alone liable to Carcinoma, which seldom appears before thirty-seven. The majority of patients are upwards of thirty-eight; a relatively small minority are attacked between thirty-two and thirty-eight.

The fact affords material assistance in diagnosis. The probabilities are largely in favour of the Benign character of a 'lump' in the breast at an earlier age. After thirty-seven, every such growth is either primarily cancerous, or is certain ultimately to become so in one form or another.

Every gradation between the chronic Scirrhus and the acute Encephaloid is met with. The difference is one of

degree, not of kind. The former is by far the most common.

Both pass through an early painless, or nearly painless, stage. But the painless stage of Scirrhus lasts a few weeks only, strangely contrasting with the suffering later on. Whereas that of Encephaloid often continues almost to the end.

The first essential to either is the operation of the exciting cause for a period varying between two and six weeks. Then in some part of the organs appears an ill-defined hardness or thickening of the breast-tissue. Both mammæ, and all regions thereof, are equally liable.

The painless induration gradually increases to a palpable 'lump,' aching after prolonged manipulation, but not even tender on immediate pressure. The distinctness of the swelling largely depends on natural configuration. A mass of considerable size may be masked, except to expert examination, by fat.

Next a transient dart of neuralgic pain is felt once in several days. It becomes more and more frequent. In the interim, the lump aches after manipulation, but is otherwise unnoticeable.

Within from six to twelve weeks the infection will have extended from a scirrhous cancer of the outer two-thirds to the axillary lymph-glands. A month later these betray the fact by enlargement.

In a Carcinoma of the inner third, or Sternal border, there will be no axillary deposit, as a rule, for several months later than with the preceding.

The 'lump' enlarges, becomes tender and painful, implicates the skin-covering. Inflammation sets in. Sometimes an abscess forms and bursts, the sore subsequently fungating. More often the skin becomes livid, and is gradually eroded.

Then begins the real suffering, popularly identified with 'cancer': the continuous burning pain, mingled with neuralgic darts. In their physical characters, the ulcers greatly vary. Most are shallow, with hard, livid edges, fœtid discharge, much puckering of the parts around; others show prominent granular bosses. From time to time all bleed, and many slough. I have even seen the whole breast become gangrenous, and separate *en masse*.

The infected axillary glands soften, burst, and ulcerate. Previously the axillary vein has become blocked. Thus ensue stasis of both blood and lymph currents, with the result of an enormously swollen arm (**Brawny Œdema**).

The lymph-glands above the clavicle subsequently enlarge, but rarely ulcerate.

The opposite mamma may be eventually infected, but never for at least two years after the first; commonly much later, and as a sequel of marrow-deposits.

In the secondarily attacked breast the cancer runs a peculiarly different course from that seen in the first. It never softens, and never ulcerates. There is no pain or appreciable trouble. At the utmost there is some tenderness on pressure.

Multiple nodular deposits stud the chest-wall, and often the skin in distant regions. This is the result of *dissemination by the subcutaneous tissue*.

The visceral organs, notably the lungs and liver, are attacked as the result of a general *blood-infection*, secondary to deposit in the Lymph-glands and Marrow.

Prompt **diagnosis** of Carcinoma is rarely a matter of the least difficulty. The age, the causation, the peculiar hardness of the common Scirrhous form, the utter painlessness of the 'lump' except in respect of its sudden neuralgic darts, are sufficiently characteristic.

In stout persons both the primary tumour and the enlargement of the secondarily infected glands may long be unobserved, unless the examiner be accustomed to cancer-phenomena.

Difficulty in distinguishing the primary growth will disappear on bimanual examination. One hand placed flat on the thoracic wall sustains the organ. The second then easily distinguishes any abnormal thickening.

Deposit in the axillary lymph-glands must be inferred from the duration and physical characteristics of the mammary tumour. Recognition of the gland-enlargement by touch is an unimportant matter.

Cure by operation is rarely possible after three months' duration. It is then precluded by infection of the Bone-marrow. All undertaken at a later date, with the exception of a few 'Atrophic' cases, must be regarded as palliative, and promptly supplemented by medicinal treatment.

To permit permanent eradication, therefore, the disease must be recognised before there is palpable enlargement of the axillary glands.

The 'Cavernous Scirrhus' of older writers—a deep ulceration-chasm in the mamma, with but a thin layer of

surrounding induration—is the sequel of an Intra-Cystic Carcinomatous vegetation.

The 'Fungating Adenoma'—a large vascular bleeding mass of granular cell-growth, not infecting the glands, but killing by the exhaustive drain of blood-serum—was the similar sequence of an Intra-Cystic Sarcoma.

The 'Cuirass Scirrhus' was a diffuse and continuous infiltration of the skin and subcutaneous tissue by that variety.

The opposite mamma is not attacked by cancer except as a sequel of infection from the first. *Ordinary 'cancer' never arises bilaterally, though the congenital forms may.*

Sarcoma does not distally infect the Lymph-glands, and the axilla must not be touched. If not previously diagnosed, it is therefore essential to recognise the species at operation.

A Carcinoma is granular in consistence, ashy-gray in colour. A Sarcoma is in parts white and fibrous, elsewhere gelatinous, straw-coloured, easily broken down with the finger. There is usually the Cyst-wall, still remaining as a capsule.

A true Sarcoma is seldom met with in the Mamma except as the sequel of an Intra-Cystic Vegetation.

Both Carcinomata and Sarcomata may be complicated with cyst-formation in various ways. These are detailed in Chapter XVII. The cyst most often precedes the cancerous growth.

When **malignancy** supervenes on a pre-existing cyst, the fact is announced by quick increase, pain, and

manifest hyperæmia. Which cancer-species may be in question long remains doubtful. The point is of little moment until an operation takes place. It then becomes material in view of the Lymph-gland treatment. A microscopic 'scraping' will promptly resolve doubt.

An Intra-Cystic Vegetation is always a potential, most often an actual, cancer. The capsule long delays auto-infection.

Carcinoma arising in or about the nipple runs a more gradual career, and can often be successfully removed at a much later stage than in other parts of the mamma.

Cancer of the male breast remains long localised, and so is cured with ease by timely operation.

The numerous variations in site, degree, cyst-complication, infective phenomena, etc., of malignant breast-lesions, indicate corresponding modifications in operative *technique*.

CHAPTER XVI.

INFECTION OF THE BONE-MARROW: ITS PRACTICAL BEARINGS UPON TREATMENT.

Discovery that, in its ordinary career, the prevalent 'cancer' of the female breast infects the marrow has cleared up much previously mysterious in the phenomena of that disease, and of some other malignant lesions.

Demonstration that these **secondary marrow-deposits** may lie perfectly latent, or with extremely scanty signs of their presence, within the bones for a long term of years has cast material light on the qualities of that structure as a receptacle for hidden *materies morbi*. It may be expected eventually to elucidate many other obscure problems in non-cancerous maladies.

The condition has also an important practical bearing on Treatment, surgical as well as medical.

A paper by Mr. S. Paget in the *Lancet* of March 23, 1889, may be consulted as a summary of knowledge on the point to that date. It was then known that Mammary Carcinoma is accompanied, in a few rare instances, by peculiar lesions in the bones. Sometimes the bone broke

on trivial violence, as when the patient turned in bed. Sometimes one or more tumours grew on bones. Sometimes, as in the vertebræ, there was marked deformity and distortion.

It was under these very palpable conditions only that the bones were examined. Moreover, certain German pathologists, with the wonted laborious industry of their race, had cited statistics dealing with many hundreds of cases. Only the few conspicuous lesions aforesaid were noted—*i.e.*, about 2·5 per cent. The remainder were recorded as free.

Statistics involving large figures such as these bear down all doubt or opposition by sheer weight. Hence the dangers of ponderous statistical arguments in general upon complex controversial points, unless every possible source of error has been judicially eliminated.

The conspicuous virtues of the German character, its conscientious labour among minutiæ, its never-failing patience, its dauntless perseverance, are thus on a wrong tack apt to become scientific vice.

The present overweening reverence in England for physiological or pathological *dicta* emanating from a Continental, and especially from a German, source does much to hinder progress and perpetuate error. Almost any statement with the credential of a foreign origin is likely to obtain credence without criticism or analysis.

The figures above quoted have thus served to blind pathologists not only to the presence of these Marrow-lesions in breast-carcinoma as a routine event, but also to

divert their attention from an important tissue hitherto all but disregarded in pathology.

Before 1890-92 the lesions aforesaid were attributed to absorption of lime-salts. To this day museums contain specimens labelled 'Fragilitas Ossium in Cancer,' or some description with that purport.

Even in the very palpable 'spontaneous fracture,' the actual presence of cancer-cells was hardly suspected, the marrow being seldom examined microscopically.

All ordinary cases of Mammary Carcinoma infect the bone-marrow within a few months, averaging three to four.

Cases of the 'Atrophic' class fail to do so for several years. The symptoms are scanty and obscure. A few may escape altogether. The facilities for post-mortem investigation at Vienna should invite reliable statistics on this point. Here such opportunities are scanty.

'Insidious' Marrow-infection takes place immediately after the axillary gland-enlargement which constitutes the second stage of Mammary Carcinoma. It is thus seldom absent after three or four months from inception. But no physical signs appear for at least a year.

The bone most often first implicated is the adjoining **Humerus**, and the event appears to be a consequence of the blockage of lymph-currents by the enlarged lymph-glands. The obstructed currents regurgitate, and thus cancer-protoplasm (fragments of nuclei) is conveyed in a vital state to the central marrow.

Next to the Humerus, the **Sternum** is infected, though in a certain class of cases the order is reversed. There is

a direct current of lymph to the remains of the Thymus gland, a lymph-organ never wholly obliterated. Thus cell-fragments reach the latter, proliferate, and subsequently infiltrate the bone. Some may reach the sternum directly.*

In advanced cases there is direct infiltration of the sternum, ribs, and even humerus; but the 'Sternal Symptom' occurs long before this. Marrow-infection, uninfluenced by operative procedures, is *distal*.

Modified, on the other hand, by the division of lymphatics which an operation involves with the resulting cicatrix, the direction taken by this infection may be variously altered from the ordinary rule. I have occasionally seen tumours arise distally on the ribs. There may be a bulging of the whole sternum. There may appear deposits in distant bones, while those usually implicated escape.

The **lumbar vertebræ** are always, or nearly always, the seat of deposit. Hence the gnawing lumbar pains so commonly described.

After a period varying from two years to five or six, in cases not treated medicinally, insidious Marrow-deposits further infect the blood, producing metastases in the viscera and in more distant bones.

* Both these last points are subject to revision by competent investigators. I see no other way of accounting for the distal infection of the adjoining humerus (see Mr. Moore's case of Lymph-Regurgitation cited at p. 70 of *Treatise*). I can explain the 'sternal prominence' at a particular spot only on the above ground—of deposit in the Thymus. But marked bulging at this spot, though common, is not invariable.

The **Marrow of long bones**, with a central medulla, becomes converted into a tough substance, white as ivory, contrasting with the normal red or yellow of the healthy structure. This is absolutely pathognomonic of carcinoma.

That test does not hold with the soft cancellous tissue of the vertebræ or sternum. Marked softness of the bone renders probable the existence of deposit, but the colour of the marrow is unchanged. A microscopic examination is necessary to prove the presence of cancer-acini.

Insidious Marrow-infection produces certain obvious physical signs after one or two years—not earlier.

Without any indications at all, the condition, however, must be assumed as present after a certain duration; the special symptoms will appear later.

The first, of no great practical value, and hardly to be much relied on, is an ill-defined fulness and seemingly increased thickness of the Humerus on the side of the disease, in its upper third. The bone is here tender on pressure.

The most characteristic is the 'Sternal Symptom.' This bone gradually becomes conspicuously prominent at the junction of its upper and middle portions, *i.e.*, between the articulations of the second ribs.

Many women have a congenital prominence of the part. It is only when, after or with a breast-carcinoma, *a gradual development of the projection has been observed by the surgeon*, that we can point to this as assuredly indicative of Marrow-deposit.

As a rule, the prominence becomes conspicuous—most so in stout persons with broad chests—and then remains stationary. No pain attends it, or other inconvenience. The patient herself seldom notices it at all until pointed out.

I have seen this sternal prominence develop into a bossy fungous tumour only four or five times in some thousands of cases.

The third sign is the familiar back-ache, gnawing, continuous, worse at night. It is felt chiefly in the loins.

There are also various so-called 'rheumatic' pains, casually described elsewhere. Most often severe neuralgia about the scapulæ, aching sensations down the arm on the side of the disease, are complained of.

The Sternal Prominence ordinarily appears within the second year. It may be later; is never seen in less than twelve months; in thin persons may never be conspicuous at all.

In cases not medicinally treated, marrow-deposit must sooner or later infect the blood, and be followed by visible 'recurrence.' Generally nodular deposits will appear in the course of the third year after an efficient palliative operation.

No reliance, of course, can be placed upon the 'Volckmann's limit,' according to which a woman whose breast has been excised for cancer, and who remains outwardly free from disease at the end of three years, is cured absolutely!

Palpable 'recurrence' within two years, unless the cancerous growth have previously reached an advanced stage, almost always implies that an unscientific operation has been performed, however favourable the immediate recovery.

After intermittent treatment with opium, there will be considerable delay in the 'recurrence.' Ordinarily, no nodules will be noticed for five to six years.

The more persistent the treatment, the longer this delay, with health in the interim seemingly perfect.

As already stated, there is reason to believe that under favourable conditions the marrow-deposits may become permanently encysted and inert. (See Cases 2 and 3.)

On the other hand, cessation of opium-treatment after the 'Volkmann's limit' is usually quickly followed by lassitude, debility, and palpable 'recurrence.'

Marrow-infection, as a routine event, occurs only with Mammary Carcinoma.

Only with this does it remain throughout, as a rule, inconspicuous and 'insidious.'

It is primarily distal, *per* the lymphatics. Later on, infiltration by contiguity may be superadded.

It occurs only casually and exceptionally in other forms of cancer. There then ensue conspicuous physical signs. *Direct* infiltration precedes.

Thus, secondary deposits in the humerus have been noted in rectal cancer; but there has always been a fracture or

tumour, and direct infiltration of the pelvic bones had been previously established. A like train of events has been recorded in cancer of the stomach, and in melanotic lesions.

All **malignant deposits** which implicate the medulla of a long bone are prone to cause multiple bone-tumours in distant parts.

The more acute and striking examples of this rather rare event have been described as 'Multiple Primary Sarcomatosis.'

'**Acute Traumatic Malignancy**' exemplifies the same law. After injury to the medulla of a long bone, multiple cancerous growths appear in distant parts within a few weeks.

There has been first a cancer, either Periosteal Sarcoma of the bone or Lympho-Carcinoma of the marrow, at the seat of injury. Secondly, general blood-dissemination.

Mollities Ossium, Osteitis Deformans, are diseases of the skeleton, in which a similar development has occurred gradually and inconspicuously.

There was first a cancerous tumour somewhere in the bone-marrow. Sometimes this has been detected in the cases recorded (*Treatise*, p. 303). Often it has escaped notice.

Secondly has ensued general dissemination in the marrow, with decalcification of the bone around. Other

tumours may appear, or there may be local hypertrophy. Or only the softening process may become manifest.

The bones infected by breast-carcinoma can often be cut easily with a knife. This softening is well marked, with other malignant growths, such as Osteoid Sarcoma, which themselves are peculiarly hard (*Treatise*, p. 132).

In malarious countries the parasite *Hæmatophyllum malariæ* occurs in the marrow of birds when absent from the blood. There is every probability that the *Filaria sanguinis hominis* retires during the remission period to the same convenient resting-place.

No one now recognises 'Cancer-cachexia' as anything special to cancer, or except as the result of many causes combined. The sallow anæmic condition exhibited by patients with marrow-deposits, in whom palpable disease is absent, may partly explain the stress formerly laid upon this physical sign.

Practical results in treatment to which recognition of the 'Insidious Marrow-infection' has led are apparent in other chapters of this work.

An absolute **cure** by excision of the Mamma for Carcinoma can be proclaimed only when—

(*a*) That possibility is not negatived by too long previous duration.

(*b*) After three years' interval with immunity, careful examination reveals no trace of the obscure physical signs indicative of marrow-infection.

REFERENCES TO THE MARROW-RESEARCHES ABOVE CITED.

The first clue to existence of this unsuspected marrow-infection was afforded by the Humerus-condition. 'A Neglected Symptom of Breast-Cancer,' *Lancet*, 1880, Vol. I.

The general fact was announced in *The Reappearance of Cancer, and its Prevention*, 1880.

The details of various cases were worked out in the *British Medical Journal*, March 12, 1892.

Statistics were adduced in the *Practitioner*, August, 1894; *Lancet*, January 9, 1897.

Further notes in verification or elucidation were published in the *Lancet*, March 7, 1891; July 11, 1891; July 6, 1892; *British Medical Journal*, March 10, 1894.

Its practical import was discussed in 'Notes on Three Hundred Cases of Breast-Excision for Cancer,' *British Medical Journal*, October 17, 1896.

A specimen indicating the Thymus-origin of the 'Sternal Symptom' was shown at the Nottingham meeting of the British Medical Association in 1892.

Descriptive Plates are given in the *Treatise*, 1893.

CHAPTER XVII.

BENIGN TUMOURS AND THEIR RELATION TO CANCER.

In common parlance, a '**Tumour**' is any 'lump' abnormally occurring in the tissues, and of more than temporary significance. It may be cancerous or 'Benign.'

In a more technical, and yet far from accurately defined, sense, a solid 'Benign' tumour is a hypertrophy or overgrowth of some natural organ or tissue, whose structure is not thereby essentially altered, though the relative proportion of normal constituent elements is no longer maintained.

Also, speaking somewhat generally, a 'Cystic Tumour' or cyst is a 'lump' produced by the enforced retention of some natural product, of fluid or quasi-fluid consistence, which should properly have been evacuated.

Many so-called 'Cysts,' however, are of the Blastoma order, due to embryonic residua. Others are produced by the degeneration of secondary cancer-deposits (see Appendix B in *Treatise*, on 'Multiple Cysts in Divers Organs'). While a few are the result of absorbed blood-clot.

The essential difference in attributes between Cancer and a 'Benign Tumour,' whether cystic or solid, lies in

the 'Auto-Infection' and 'Progressive Erosion' of the former, so that it attacks many parts in addition to that wherein it began; whereas the latter remains a purely local 'lump,' emitting no infection, and doing no harm, except by its bulk and other mechanical properties.

Some Benign Tumours never, or only in the rarest possible instances, develop cancer. Others do this with moderate frequency. And a third class again invariably do so in the course of time. Hence the line of demarcation between Benign and Malignant tumours is as ill-defined and variable clinically as it is pathologically.

The common **fatty tumour (Lipoma)** has no tendency to become cancerous. Neither has an Osteoma or exostosis. Yet cases apparently presenting an exception to the rule are cited at p. 124 of the *Treatise*.

Sebaceous cysts of the scalp, the familiar wens, are ordinarily harmless, though unsightly. When ulcerated, many have passed into epithelioma.

Simple fibrous tumours on the gum (epulis) commonly merge eventually into Sarcoma. Cheloid cicatrices are stated occasionally to show the same reversion, though more often the seat of Epithelial cancer. Sarcoma-transition is microscopically evident in many Enchondromata.

The **Mammæ** and **Uterus** are a too prevalent site of Benign tumours, as well as of cancer; and the conversion of the former into the latter is specially conspicuous and common in the organ first mentioned.

The female breast passes through three stages:

1. Evolution or development, ranging between the ages of thirteen (ordinarily) and twenty-five.

2. Functional Prime, from twenty-five to thirty-two.

3. Devolution or permanent degeneration, from the age of thirty-two onwards.

The first displays tumours, wholly Benign, and generally cured easily without a surgical operation. The second is for the most part free from tendency to tumour-formation at all. The third is the period of cancer; or of new-growths, which ultimately pass into cancer.

It is necessary further to note that each month witnesses an inconspicuous and evanescent stimulation. Tenderness, sensations of heat and of fulness, indicate increased flow of blood to the breasts, which takes place at each menstrual period. With these outward signs are associated interior cell-growth.

A delicate process of enhanced cell-proliferation, followed by decay, takes place. It differs only in degree from the full functional activity instituted by pregnancy.

This process is carried on under control of the nerve-centres, and is easily impeded or prevented by any derangement of the latter, particularly by depressing emotion. Also by mechanical injuries or obstacles.

The '**Fibroma of Adolescence**' is that harmless tumour which almost exclusively prevails during the development period, æt. 13 to 25.

The condition is known by other titles, more or less misleading, and failing to indicate its chief structural characteristics: 'Adenoid,' 'Adenoma, 'Chronic Mammary Tumour,' etc.

It is merely an over-growth of fibrous tissue, enveloping a few scattered acini.

The 'Fibroma of Adolescence' appears in the mamma of the young girl as a solid, moderately hard 'lump.' In size it varies from that of a pea to a walnut. Occasionally it attains a larger size, but comparatively seldom. Generally more than one are found, and both breasts are affected, either simultaneously or successively. The tumours are mobile. There is no tendency to cyst-formation, and, of course, no gland-enlargement.

Although causing groundless alarm because of their outward likeness to cancer, these growths give rise to no harm or trouble beyond what may be due to the fears or neurotic temperament of the individual.

There is usually tenderness and pain at the periods, which is greatly aggravated by excess in tea-drinking.

This malady is perfectly innocuous, except for the mental uneasiness. Only in very rare instances has the 'Fibroma of Adolescence' been detected side by side with a cancer. It vanishes with pregnancy.

Like most other lesions susceptible of natural cure, it is generally remediable without resort to surgical operation. For details and cases see 'Dispersible Tumours of the Mamma' in reprinted papers.

In a young girl resort to the surgeon's knife until therapeutic measures have been tried is thus strongly to be deprecated; the more so that both mammæ are commonly attacked, and the growths multiple.

When development is complete, *i.e.*, after the age of twenty-five, dispersion is not so readily attained as when the Fibromata are recent; and is often impossible.

The cause of these 'lumps' is mechanical interference with the proper development of the mammæ by tight or ill-fitting stays, usually sufficiently obvious.

The innocuous 'Fibroma of Adolescence' further differs from the dangerous 'Cystic Fibroma' of middle age in being throughout solid, and with little or no tendency to cyst-formation.

During the middle period, æt. 25 to 32, tumours seldom appear, except as persistent from the former age. 'Lumps' of inflammatory origin occur with lactation or pregnancy; are generally irritated lobules, yielding easily to treatment.

Occasionally cysts near the nipple, due to dilated ducts, are found. These are a local condition due to some obstruction of the latter and are essentially distinct from the cysts of the 'Cystic Fibroma,' which are dilated acini.

All the tumours of the third period, from thirty-two onwards, are highly dangerous, as either primarily malignant, or certain eventually to become so.

The most common primarily Benign tumours are those caused by **Cystic Degeneration of the Gland-substance.**

Though only one relatively large cyst may be at first apparent, yet the condition is always a general one. The whole gland-tissue of both breasts becomes studded with minute cysts (dilated acini), which do not attract attention until they considerably increase in size.

Sometimes one enlarges, sometimes several, sometimes the whole organ becomes converted into a congeries of

cysts, with hardly any solid substance intervening. The most common condition is the growth of one or two so large as to attract attention, and invite surgical interference, the bulk remaining almost microscopic.

The causes of Cystic Degeneration are identical with those of Carcinoma—anything interfering with normal devolution.

Cystic Degeneration and the cystic tumours it produces are painless and harmless until malignancy supervenes. That event is in the end a matter of certainty, though it may be delayed for years, until age is advanced.

These Mammary Cysts of mature age are ultimately attacked by:

I. Carcinoma.
II. Sarcoma.

Carcinoma is developed from either:

(*a*) The acini included in the cyst-wall.
(*b*) The acinar epithelium lining the cyst.

The acinar epithelium lining the cyst-wall is columnar in shape, and so the title 'duct-cancer' has erroneously been conferred on the malignant lesion (Carcinomatous Intra-Cystic Vegetation) to which it gives rise. The shape, however, of epithelial cells varies (as hourly in the bladder) with slight modifications in the environment. (For other examples of permanent epithelial mutation, see *Treatise*, p. 157.) The columnar form is only a general attribute of epithelium lining closed cavities or spaces.

From the cyst-wall sprout vegetations, which inosculate, the result being meshes lined by the columnar cells in

question. This goes on until the cavity of the parent cyst is completely filled, up to which stage the cancerous new-growth is 'encapsuled.' Next follows infiltration of the wall and surrounding tissues, with secondary lymph-gland infection, and the usual phenomena of scirrhus.

Such, roughly speaking, is the course of these 'Carcinomatous Intra-Cystic Vegetations.' But the infiltration may implicate the parts around before the cyst is filled.

Otherwise there is not ordinarily any auto-infection while the capsule (*i.e.*, cyst-wall) remains intact. Hence excision of the breast alone usually proves curative, without that of the glands.

Carcinoma developed from the acini in the cyst-wall follows the ordinary career of scirrhus, with rapid lymph-gland infection.

Carcinomatous Intra-Cystic Vegetations are the prevalent mode of malignant development in the mammary cysts of after-life. The next form occurs only in a minority of cases.

True Sarcoma attacks these cysts in two ways.

1. Most often Intra-Cystic Sarcomatous Vegetations of spindle-celled tissue sprout forth. These are from the first malignant.

2. Occasionally the cyst becomes completely filled by well-formed fibrous tissue, so that all the fluid disappears, and nothing remains but solid, irregular masses within a capsule. Ultimately embryonic spindle-cells make their appearance, and the disease is henceforward cancerous.

Vegetations of either kind within a cyst cause pain by distension, and induce removal. It is not possible to distinguish the sarcomatous from the carcinomatous, until the latter have in an advanced stage infected the lymph-glands.

Both long remain local, and without secondary deposit, the sarcoma, however, longer than the carcinoma. (See Chapter XVIII.)

Next in prevalence to the 'General Cystic Degeneration' of the decadent mamma is among primarily benign neoplasms the Cystic Fibroma, also called Adeno-Fibroma.

The '**Cystic Fibroma**' structurally differs from the 'Fibroma of Adolescence' in being invariably associated with cysts, which are not ducts, but degenerate and dilated acini.

Cystic Fibroma and Adeno-Fibroma are one and the same lesion. Sometimes the cysts predominate, sometimes the fibrous tissue.

Both again, though differentiated by some authors, are merely a phase of the Cystic Degeneration aforesaid, in which there is overgrowth of the interacinous fibrous tissue. They own the same causation, and follow the same laws of development.

The Cystic Fibroma is seldom noticed under the age of thirty-seven. It grows slowly and painlessly, especially if the included cysts are minute, to a large size, without impairing health or causing any trouble except by its bulk.

Then cancer finally supervenes. This may be carcinoma or sarcoma—most often the former. Either the acinar

epithelium gradually invades the solid base, with the result of ordinary scirrhus, or the previously well-organized fibrous tissue gives place to an embryonic mass of malignant spindle-cells—'Spindle-celled Sarcoma.'

The occurrence of either event is denoted by the advent of severe pain, with rapid increase. The Carcinoma, of course, will quickly infect the axillary glands. Not so, the Sarcoma.

The Cystic Fibroma is wholly irremediable by medicine, and, though growing slowly for a long term of years, should be promptly removed by operation, for fear of the cancer-supervention. When thus dealt with in the pre-malignant stage, it will not, of course, re-appear.

The preceding are the only common and prevalent forms of Benign Tumour in the breast-substance. Tumours in the subcutaneous tissue, such as sebaceous cysts, nævi, lipomata, may simulate growths of the mamma itself.

Very rarely occur strange masses of cartilage, or of very hard imperfectly formed bone, which are probably derived from embryonic vestiges. The fact is, however, not proved; nor, so far as I know, have these mysterious developments been investigated in the light of that probability. The Cancer Hospital museum contains a specimen in which the whole breast has been converted into ivory-like material, much denser than true bone.

The **Uterus** presents a remarkable analogy to the mamma in liability to Benign tumour-formations, as well as cancerous. But in many respects the conditions conspicuously differ.

The familiar **Myomata, 'Uterine Fibroids,'** appear between the ages of thirty and forty-five, sometimes a year or two sooner. They wholly consist of well-organized unstriped muscle, are almost always multiple, cause various symptoms due to mere bulk and pressure, may grow to a huge size or remain permanently small, may be wholly unfelt, may render life a burden by the attendant suffering, or may kill in several ways, chiefly mechanical.

They are simple 'aberrations in nutrition,' overgrowths of healthy tissue.

Myomata appear, like cancer, restricted, or almost so, to the civilized state. Their development is synonymous with the abuse of the corset, particularly during pregnancy.

As a rule, though not devoid of danger in other respects, they seldom become cancerous. In a minority of instances, however, they undoubtedly do so after a pre-cancerous stage of years.

The cancer-species is Myo-Sarcoma. For examples of the transmutation see *Treatise*, Chapter V.

Under the title **'Soft Œdematous Myoma,'** that very original gynæcologist, Lawson Tait, confounded two distinct conditions. One was Primary Uterine Myo-Sarcoma, wherein a cancerous growth commences in the uterine muscle, independently of a pre-existing myoma. The second, a mere variant of the Benign Myoma, in which the bundles of muscle-fibre are loosely bound together, and there is much serum within the intervening connective tissue.

The first, of course, is truly malignant, rapidly killing, producing auto-infection, with visceral metastases. The second is benign, a merely local condition.

The sequence of cancerous **Myo-Sarcoma** upon a previously long-existent benign myoma is probably more common than is now recognised. The pelvic tumours of women are rarely studied with much reference to their pathology.

I have several times known a benign myoma cause carcinoma of the cervix by its mere presence and the local irritation thus excited.

The very varied career of Uterine Fibroids in individual cases indicates that each must be dealt with on its own merits. As a general rule, myomata are hardly to be subjected to the 'knife' unless they are progressively increasing to an inconvenient size, cause pain, impair health, and disqualify for the ordinary duties of life. Unless, in short, there is some more cogent reason than the mere presence of a hardly felt 'lump in the side,' they are, as a rule, best treated medicinally. The rapid improvements in *technique* and consequent safety which every day witnesses may, however, eventually change that rule.

Should an operation be required, one or other form of intraperitoneal excision is infinitely preferable to the older modes.

Setting aside the comparatively mild cases, in which enucleation suffices, the safest and most efficient plan is that originally devised, I believe, by Dr. Heywood Smith,

and which has since been materially facilitated by the adoption of the Trendelenburg position.

The organ is here divided on a level with the os internum, muscular flaps closing the mucous canal, peritoneal ditto over these, accurately excluding risk of sepsis. Thus all but the cervix is removed.

Pan-hysterectomy is more difficult, involves more liability to hæmorrhage, more danger to the ureters. That the cervix is often the seat of myomata is hardly a valid argument in its favour, such being always small and insignificant.

The best medicinal treatment for Uterine Myomata consists in moderate doses of opium persisted in until all increase is arrested. I have never seen benefit from anything else—ergot, hydrastis, electricity, etc.

There is every reason to believe that we should rarely encounter Benign Tumours in the female special organs, were stays abolished by imperious fashion, or worn only in forms compliant with hygienic principles.

CHAPTER XVIII.

REMARKS ON THE MICROSCOPE IN CANCER-SCIENCE—MICRO-PHOTOGRAPHY.

The conclusions of the microscope, as expounded by a pathologist, are commonly received with almost superstitious respect. To many men the instrument is almost a fetish.

Yet, in the present imperfect state of medical education, these conclusions are often misleading. Errors may result from faults in the lenses themselves. More often, however, they ensue on the method of employment, and on the absence of distinct principles to guide a verdict.

The nature of an ordinary cancer-specimen can be readily appreciated by any educated practitioner. The most expert pathologist will often encounter cases whose real significance he can hardly determine, after days of laborious investigation.

These difficulties are commonly glossed over by the use of general terms. 'Sarcoma' is a typical example; perhaps of all medical words, the most ambiguous.

The first essential of progress is a precise Technology; the second, a code of simple rules for identification. Both are now conspicuously wanting.

Until this much-needed reform takes place, microscopic reports can only be received with reserve, and not held as more than adjuncts to a diagnosis based on general probabilities and clinical phenomena. Its conclusions should be regarded as invalid, without corroboration from other sources.

In the classical and most deplorable case of the late German Emperor, a portion of healthy tissue, not implicated by the cancer, was removed for microscopic examination by the foremost pathologist of the day, whose scientific pre-eminence only served to accentuate a necessarily false verdict on the question at issue.

Often a mere hypertrophy of gland-tissue is erroneously regarded by the microscopist as malignant. This is particularly the case with uterine lesions, such as the common 'granular erosion.'

A cancerous infiltration acts as would a foreign body inserted into the tissues; that is to say, it is invariably surrounded by the same physical signs of inflammation.

No overgrowth of uterine or other glands can be pronounced cancerous, unless there is a profuse invasion of leucocytes pervading the healthy tissues adjoining. Many errors would be prevented by attention to this point, not recognised by ordinary text-books.

The structure of a non-congenital cancer is always a mimicry of the parent-tissue, both in cell-arrangement and in the quality of the individual cell.

No species of cancer can possibly arise, where the variety of cell from which it springs is wanting. Thus,

although that valuable storehouse of very raw material, the *Transactions* of the Pathological Society, contains many cases of 'Primary Melanotic Cancer' of the Liver, the occurrence of such a lesion is plainly impossible, because there are here no melanine-secreting structures from which it can spring.

No cancerous growth can be designated a 'Sarcoma' without the special badge of a malignant growth in the connective tissues, *i.e.*, spindle-shaped many-nucleated cells, more or less ranged in bands.

The so-called 'Round-Celled Sarcoma' has none. On careful examination, the cancers so styled prove to be Carcinomata, as in the mamma; or Lympho-Carcinomata, as in the lymph-glands or marrow; or Blastomata, as in the ovarian or renal lesions of children.

Multiplicity of component structures is a frequent, though not an invariable, badge of the congenital cancers, or Blastomata. Thus, tubules, cysts, carcinoma-tissue with the spindle-cells of sarcoma; in the more organized, curious admixtures of nerve, muscle, glands, cartilage, fat, bone, etc. Any specimen not susceptible of identification by ordinary rules will generally be referable to this obscure group.

In the last generation, the rough 'scraping' of a suspected tumour was examined for 'cancer-cells.' In the present day that method has been superseded by the more pretentious investigation of elaborately prepared thin sections, in many ways to the detriment of science.

Each plan has its special advantages, and each is equally necessary. Often, indeed, the former is more really instructive than the latter.

Cut Sections reveal the structure of the new growth as a whole, and the relative arrangement of its component parts. They are wellnigh useless for showing minute details, such as the shape of cells, and will thus frequently mislead those who rely wholly upon them.

Moreover, the thin section passes through a complicated process of preparation, any single step whereof must needs materially alter, if not disguise, the natural appearance of delicate cells and their nuclei.

The real shape even of cells, setting aside their intimate structure, can only be accurately realized by studying them as nearly as possible in their pristine condition.

It is further essential that they should be more or less isolated from their environment. A rough-and-ready '**Scraping**' from the cut surface, with the aid of some non-alcoholic dye, alone permits this. Gentian-violet is a useful stain for this purpose.

Hence neither plan can be safely neglected by the pathologist. The cut section commonly shows cell-nuclei only, while disguising utterly the shape of the cell, under conditions highly important in respect of diagnosis.

Thus, the fusiform shape of sarcoma-cells is often completely hidden by the prepared section, while it would have been proclaimed at once by the 'scraping.' This is specially the case with the more acute and rapidly advancing sarcomata.

The customary examination of prepared sections only has caused the neglect of an important point, once fully recognised, now almost forgotten : *The malignant cell, whatever its tissue-origin, is essentially characterized by multiplicity of nuclei or nuclear bodies.*

Thus, ordinary epithelial cells, the modified ditto of secreting glands, connective-tissue corpuscles, the corpuscles of non-striated muscle, even the minute lymph-gland cells, when attacked by the 'Cancer-Process,' all agree in containing several, often many, nuclei.

Provided that the cell be examined as aforesaid, the observer will first see two or three relatively huge nuclei. With higher powers of the microscope, he will find that number increase, often considerably. Roughly speaking, every increase in magnification will display more nuclei, or more nuclear bodies apparently becoming differentiated from any or every region of the cell-protoplasm. That is the average rule. We rarely see mitosis, regular or irregular.

A rather **common error**, which involves many false diagnoses, is that of commencing the examination with a medium or even high power of the microscope. Thus too near a view is obtained of details, which should first be scrutinized from afar, otherwise it is impossible adequately to gauge correlation and proportions.

It is essential to begin examining the cut section of a cancerous, or presumedly cancerous, growth, with a microscopic power not higher than $\frac{2}{3}$ inch. Zeiss A is excellent for this purpose, and daylight illumination is preferable.

When the geography has thus been generally ascertained, the finer details will be investigated with the one-fifth or one-sixth objective. DD *Zeiss* answers well; and so on to higher powers, which, for accurate definition, will necessitate the lamp.

The prevalence of uterine cancer renders that organ a special field of microscopic research for diagnostic purposes. When the question of Hysterectomy is impending, the avoidance of error becomes doubly essential.

The experienced gynæcologist will place most reliance on the symptoms and circumstances of the case, and the *a priori* probabilities.

The age, above all; next, the causation-history, antecedent troubles, or their absence; lastly, the local and general phenomena, are points which will seldom fail to afford ample material for a judicial conclusion.

In uterine disease it is rarely safe to base a diagnosis of cancer upon microscopic evidence. The cell-proliferation of cancer is closely imitated by natural changes in the endometrium, as also by some morbid, though non-malignant.

In suspected Epithelial Cancer of the Tongue or Mouth, no reliable evidence is gained by scraping the mucous membrane.

So also with the Bladder, Larynx, Pharynx, etc. In all, the microscope affords most valuable corroborative testimony, which no surgeon can afford to neglect, but is an unsafe guide when used alone.

In competent hands, and barring the mistakes in question, the microscope will prove a positive conclusion, hardly ever a negative. It will demonstrate the presence of cancer; will not establish its absence.

In the matter of scientific research, it has been wittily remarked that 'there is no end to the startling discoveries a man may make, if he be possessed of a bad instrument and a vivid imagination.'

A '**Control-examination**' is as essential as a '**Control-experiment.**' To want of this is due the discovery of some of the 'cancer parasites,' which still attract attention.

Thus, the 'Parasitic Protozoa,' or bodies perfectly indistinguishable from these, can be seen in healthy cartilage-corpuscles, and in sections of the newt's testis.

Micro-Photographs of cancer, or cancer-phenomena, are generally misleading, and of less value than a well-executed drawing.

The reason is identical with one of the fundamental principles of mathematics.

As the mathematician, reasoning upon the Line, has to put the breadth wholly on one side, discussing only its length, so, when investigating a complex web of component structures, it is often imperative to concentrate the attention on certain details only, to the exclusion of the remainder.

Hence a picture, representing in equal prominence all the complex minutiæ of an ordinary microscopic section, is far from satisfactory when cancer is in question.

For the elucidation of controversial points, micro-photography is unsafe. For teaching purposes it blends too much together features important and features trivial.

The prevalent tendency of modern pathology is laboriously to accumulate Facts. Scant attempts are made in the no less important direction of classifying and explaining those facts.

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