On the re-appearance (recurrence) of cancer after apparent extirpation : with suggestions for its prevention, and general remarks on the operative treatment of malignant growths / by Herbert L. Snow.

Re-Appearance of Cancer after Operation

Snow

ON THE

RE-APPEARANCE OF CANCER

AFTER APPARENT EXTIRPATION

Ars chirurgica in rebus minutissimis diligentissime exercenda est

ON THE

RE-APPEARANCE (RECURRENCE)

OF

CANCER

AFTER APPARENT EXTIRPATION

WITH SUGGESTIONS FOR ITS PREVENTION, AND GENERAL REMARKS ON THE OPERATIVE TREATMENT OF MALIGNANT GROWTHS

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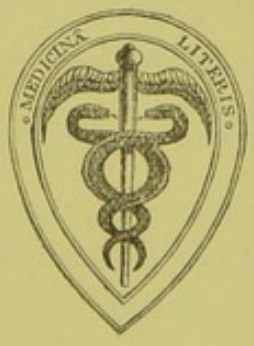

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PREFATORY NOTE

THE gravity of cancerous disease in most of its forms; and the peculiar difficulties which so often combine to defeat attempts to procure permanent immunity are sufficiently notorious.

An attempt is here made (as the result of some thirteen years' experience at a special hospital), to investigate the nature of some of these impediments in the way of a cure by surgical treatment; to point out how in many instances, they may be minimised,—if not altogether overcome.

The ill-success of remedial measures for cancer has long constituted the great opprobrium of surgery; reasons however are not wanting for the belief that at the root of this, lie needlessly desponding pathological theories, and a correspondingly timid or careless practice. That better results may be attained, by greater attention to minute details of procedure, on the one hand; on the other, by more sustained and systematic subsequent watchfulness.

In the following pages, this view receives a practical expression. At the same time, stress is laid upon the conditions which commonly directly precede the appearance of the more familiar varieties of cancer. It is believed that were these more generally recognised; a much earlier diagnosis, and with it, a vastly enhanced success in operating, would be assured.

Among the points of detail by which there appear grounds for entertaining the hope that in ordinarily favourable instances of malignant disease, subsequent re-appearance ('recurrence')

may be prevented ; the principle of intercepting the infective germs on the (lymph-gland) path by which they are ordinarily found to travel,—the 'anticipatory method,' as it has been termed,—is indicated as the one likely to produce the greatest improvement of ultimate results, in those cases susceptible of its employment.

The latent bone-deposits (more or less obvious when carefully sought for), in many female patients who have undergone excision of the mamma, for scirrhus ; are pointed out in explanation of the long period of seeming immunity, which has occasionally been reported—in connection with that local variety of cancer-growth.

Attention is also drawn to the by no means infrequent supervention of malignant processes, as a secondary feature, in tumours originally benign ; as well as to the usual origin of some kinds of malignant infiltration in causes susceptible of easy remedy or prophylaxis.

The term 'Cancer' is used throughout as a convenient, (and indeed almost indispensable) synonym for 'malignant disease.' The word 'Scirrhus' on the other hand is employed in connection with Neoplasms of the Mamma only.

6 Gloucester Place, Portman Square:
April, 1890.

ON THE

RE-APPEARANCE OF CANCER AFTER OPERATION

AND ON THE

BEST METHODS FOR SECURING ITS COMPLETE ERADICATION

I

As regards the ultimate success of all methods for their removal hitherto adopted, cancerous diseases confessedly constitute the opprobrium of surgery. However satisfactory the immediate consequences of the procedure undertaken for that purpose; however all visible traces of the lesion may have been obliterated; however rapidly the local wound may have healed; and however conspicuous may be the temporary restoration of health and strength; yet these favourable phenomena notoriously too often prove more or less transient, and fresh deposits make their appearance, either in the locality first attacked, or in parts more or less distant.

The manner in which this phenomenon was formerly accounted for, was by regarding cancer as (for the most part, at least) of constitutional origin; always (or nearly always) hereditary and the result of a transmitted predisposition; a natural degenerative change in individuals thus prone to its attack;—in such as purely a matter of sequential development as grey hair, baldness, impaired sight, or wrinkled skin. The tumour or infiltration, which had been in the first place destroyed or excised, being merely the local manifestation of a disordered condition pervading the whole organism ('cancerous cachexia'), the latter was necessarily certain to

produce further local developments—to 'recur'—sooner or later.

On this supposition (a lingering remnant of the old humoral pathology) operations undertaken for the purpose of destroying or removing the diseased growth or area were but temporary expedients; from which it was all but impossible to anticipate any permanent benefit. The term 'recurrence,' conveying the idea of something which has temporarily ceased to exist, unfortunately carries with it the idea of constitutional origin.

In later years the constitutional hypothesis has largely lost ground, and it is no longer possible to adduce it in excuse of unsuccessful treatment. In some quarters, however, it appears to survive in a modified form; certain individuals being regarded as from inherited ancestral tendencies more predisposed to cancer than others.

Although exceptional instances occur which apparently favour this view, and although it is not intrinsically improbable; no such special predisposition can be detected in the majority of cases. The rule appears to be that, given certain exciting causes, a cancerous growth will result (without distinction of temperament or of physical conditions) in any person exposed to their operation.

Every malignant tumour or infiltration is strictly localised at the outset to a more or less limited area of tissue; and all subsequent symptoms or secondary deposits are seen to result by infection from this primary focus or starting-point. When the latter is destroyed or removed before the resulting secondary infection has taken place, the individual remains permanently free. If this highly desirable object is not so effected, the germs which have been thrown off by the parent-growth—till then imperceptible—in due time appear also as palpable masses of cancer. Extirpation before secondary infection has taken place is a comparatively rare occurrence.

In all the more chronic and slowly advancing varieties, this local origin and gradual progress along a more or less definite track are sufficiently obvious. In the later stages of these, and in the acute kinds, the phenomena are obscured by a general systemic infection, and by the passage of abundant

nuclear particles into the blood-current. No wide dissemination of cancer is ever found, however, in the absence of the *mechanical* conditions which must result in the last-named occurrence—*i.e.* a loosely cohering mass of cells, abundantly supplied with blood-vessels.[1]

A few words upon the comparative impotence of all drugs at present known to us, in the treatment of malignant diseases; with an apparently reasonable explanation of their inutility, are here necessary.

In another publication ('The General Theory of Cancer Formation,' J. & A. Churchill, 1889) the following general view of cancer production has been advanced. Our bodies are wholly composed of cells, or of cell-products, of which primitive cells the amœba may be regarded as a type. These normally form one harmonious machine, whereof the central nervous system forms the central regulating power—the cell-nucleus as it were. When a cancerous growth is formed in the body (which invariably is at one spot only), the cell units at that point having been subjected to some form of irritation (more or less readily ascertainable in the majority of instances) have thrown off their allegiance to the governing power aforesaid, and have commenced a quasi-independent existence as cells; living and multiplying henceforward at the expense of the body generally, as separate organisms. Hence they no longer obey the physiological laws which regulate the remainder of the body; and hence the comparative powerlessness of medicines given internally, and operating by means of these laws.

The view, however, is also taken (as suggested by common experience), that the genesis and many of the phenomena of malignancy are largely dependent upon conditions of the nervous system. Hence that this inefficiency is only comparative; and that much greater benefit results from the administration of certain medicines which act specially upon

[1] Such a state is present in the most acute varieties of cancer (e.g. Periosteal Sarcoma), almost from the beginning; in the chronic (as Rodent Ulcer, or as many cases of Breast-Scirrhus) either not at all, or only in a very advanced stage of the disease.

the nervous system than from any others—although as yet we know of none such which will work an absolute cure.

Although the above is but a theory, it is yet the only one which complies with the first condition of a theory (as compared with a mere hypothesis), that of readily explaining all the facts and phenomena. And it is here stated, because it accounts for the resistance of cancer to treatment purely medical; as also for the inefficiency of all surgical procedures which fall short of absolute extirpation of every offending cell or cell-germ.

Whenever this has not been perfectly effected, there can be no doubt that we have to deal with a 're-appearance' not a 'recurrence'; that in almost every malignant tumour or ulcer, cancer-cells or nuclei exist among immediately surrounding tissues. The latter may be to all appearance perfectly healthy; and the presence of the minute cancer-foci cannot at the time be detected by the senses, even with the help of the microscope. The proof of this lies in the comparative results of ordinary operations; when macroscopic portions of the neoplasm cannot be excised, evidences of continued growth will be rapid and probably continuous; if the lines of incision pass very close to the palpable tumour (*i.e.* in the unencapsuled and infiltrating varieties), re-appearance is also rapid and conspicuous; if the surrounding area of impalpable deposits is removed at the same time as the palpable cancer-mass, re-appearance is tardy, inconspicuous, and mild in proportion to the degree in which that object has been attained.

On similar grounds, it cannot well be questioned that the subsequent developments of cancer in adjacent lymph-glands, in distal organs or tissues, are but the uninterrupted growth of cells or nuclear particles borrowed from the primary neoplasm; transferred to these by means of the blood-current or the lymphatic system; and there already existing, although in a perfectly microcosmic state, at the time of the extirpation of the former. The path by which the malignant germs have travelled is generally discernible with ease; and the nearer the secondary deposits are to the primary, the more advanced is the stage of that liquefactive

degeneration to which such cell-masses are prone ; indicating a greater comparative age of these, than of the more distant ; which are therefore also necessarily more recent.

II

THE prevention of 'recurrence,' then, only signifies the perfect eradication of every cell-nucleus or nuclear particle which has thus apparently become endowed with independent vitality ; and which, therefore, if undestroyed, must continue its independent growth at the expense of the remainder of the organism, and must multiply in a constantly increasing ratio. And suggestions aiming at the obviation of such new manifestations of growth have to consider the questions : 'What hinders this perfect eradication ? And how can the latter best be promoted or secured ?'

Foremost among the points on which this result appears to hinge is the question of Time—the time which has been lost before the patient deems it necessary to seek medical advice ; or the delay which may then ensue before the necessary remedial measures are adopted.

On the first named—the element of delay most commonly encountered ; the one which works the most harm in the largest number of cases, and which should be the most preventible—it may be remarked that extreme ignorance respecting the genesis and early symptoms of cancer is ordinarily exhibited by patients ; that many fallacies in respect of these diseases, have popular currency ; that a very limited amount of elementary instruction in the plainest laws of health would often save life and prevent disastrous consequences.

The two most familiar examples of such are—

(*a*) The ignorance that by far the most usual cause of tongue or mouth epithelioma is the irritation of a 'projecting tooth or tooth-stump.'

(*b*) The delusion that cancer is from the beginning a painful disease ; therefore that an absolutely painless tumour cannot be malignant.

Others of somewhat less consequence which may be instanced, and on which a casual hint from the medical attendant would often prove of service, are—

The tendency of warts or warty growths to become cancerous, most marked in the aged, and in sites, such as the face, specially exposed to mechanical irritation.

The proneness of old syphilitic lesions of mucous membranes to develop epithelioma. The tongue is a very frequent site of this occurrence. Occasionally leuco-plakia ('ichthyosis') is the pre-existing indication of such a probability; much more frequently, the constitutional condition is betrayed by irregularly scattered superficial white patches of this cicatricial tissue. Any person exhibiting these is very likely to become ultimately the subject of cancerous infiltration.

The frequency with which uterine malignant disease ensues upon neglected mechanical injuries, such as result from parturition.

The very common history of protracted mental distress, as an immediate antecedent of the same; or, failing this, of exhausting bodily toil and broken-down health.

The marked tendency of mental distress to generate cancer of the breast (and probably other forms also).

The general proclivity of the aged to malignant disease.

The ultimate tendency of cystic tumours in the mamma to develop malignancy.

The mechanical production of lip-epithelioma from an 'unhealed crack or fissure.'

Origin of rectal cylindroma in similar chronic irritative conditions, such as habitual constipation.

The belief that a cancer may be 'dispersed' by medicaments.

Many other conditions might readily be instanced, in which either prevention might originally have been assured by very simple measures taken in time; or, failing that, the general ill-consequences of the establishment of the cancerous process might easily have been reduced to a minimum.[1]

[1] The popular idea that a tumour, whether cancerous or otherwise, can be dispersed by local medicaments, is occasionally countenanced by the disappearance in this way of gummata. In the larger number of instances, those often merely hypertrophic conditions of the fibrous tissue of the mamma, which constitute the common fibroma (adenoid tumour) in this locality, and which present a close superficial resemblance to scirrhous cancer, appear to be the sources of the tradi-

The professional reasons for delay in resort to operation (as distinguished from the popular) may be briefly hinted at as follows: Absence of regard to the exciting conditions which generate cancer, and to the likelihood of a malignant tumour as the result of these; doubt as to diagnosis; reluctance to operate or to advise the severe measures often demanded; belief that 'cancer is certain to recur.'

The two instances in which the validity and ultimate efficiency of surgical treatment are most frequently in question, in which 'recurrence' is most often witnessed, and in which it would seem most largely to depend upon preventible causes, are (*a*) Cancer of the Tongue (Epithelioma); (*b*) Cancer of the Mamma.

III

CANCER of the Tongue (Epithelioma) is invariably due to continuous mechanical irritation, whereof the factors are so commonly present in this locality; and almost always begins as a simple fissure or ulcer. Its commencement in this manner is much more open to observation than is the case with the majority of cancerous formations; and its phenomena entitle it to rank as the best type of the cancerous process.

Of predisposing causes, an unhealthy condition of the mucous membrane is the most obvious and important; any agent which contributes to lower vitality thus tends to generate the cancer, merely by precluding the healing of those excoriations or fissures which must from time to time arise in almost every individual.

The most important of these, perhaps, is syphilisation, already alluded to. Next to this, chronic alcoholism and the habit of indulgence in stimulants, even when short of excess. To a less obvious extent, the generally lowered vitality of

tion. Many such diminish in size, or altogether vanish under treatment, and others are believed to become obliterated by normal processes in the course of years. How far the special treatment adopted, and how far the mental impression thence derived, may contribute towards the favourable result attained, of which the former gets the credit, is, of course, open to question.

advancing age may be supposed in the same manner to aid cancer-production.

The mechanical factor is nearly always the projecting edge or point of a tooth (which need not be carious) or of a stump. Changes of shape in the lower jaw with advancing years contribute by causing dental irregularities and projections.

The complaint is seen with much greater frequency in males than in females; and the latter sex also evinces comparative immunity from Epithelioma of the Lips, as of other parts of the buccal cavity. A comparison of the habits of the two sexes is believed to furnish a ready explanation; women owing their exemption partly to their smaller proclivity to alcoholic drinks; partly to their greater attention to cleanliness.

In large measure also to the rarity of the habit of smoking among them. That practice, although it cannot be supposed ever to excite cancerous proliferation, often apparently aids in the production of epithelioma in any part of the mouth cavity; by preventing the union of excoriations, and by inducing a generally coated state of the mucous membrane.

The disease needs to be distinguished from syphilitic, simple, and tuberculous ulcers of the part. The first is usually the suspected element which gives the most trouble, and which necessitates the most careful discrimination—difficulties of diagnosis being greatly heightened by the fact that lesions of this character, usually very chronic, are apt to develop malignancy as a secondary feature, and that it is not always possible to say whether the latter occurrence has actually commenced or not.

In no organ and in no variety of cancer is the necessity for a prompt diagnosis of more vital consequence; Epithelioma (often elsewhere extremely chronic) being in this particular locality one of the most virulent and rapidly advancing of malignant neoplasms.

Very early implication of the adjoining lymph-glands takes place; and from these again the infection rapidly extends to others more remote and more deeply situated.

So that when once glandular enlargement is conspicuously visible, it is well-nigh impossible to preclude re-appearance.[1]

The peculiarly loathsome nature of the disease in later stages, the extreme pain which attends these (which ordinarily requires for its relief much larger doses of morphia than is the case with cancerous deposits in other organs), contribute to heighten the sense of responsibility incurred when any avoidable delay is permitted to take place.

The following are grounds by which the conditions in question may readily be recognised.

The *purely syphilitic* tongue looks, frequently, shrivelled up and wrinkled; the whole organ is more or less denuded of epithelium, presents a mottled whitish appearance, often is small and pointed. We commonly find several shallow ulcers scattered about the dorsum, with intervening ridges of tissue, comparatively elevated and more or less bare. There may be sessile warty growths, usually multiple, of irregular shape, with fringed and ragged edges. The adjoining mucous membrane of the lips and cheeks presents (a very typical feature) patches of faintly white discolouration, alternating irregularly with tracts of healthy epithelium, the former appearance being 'due to shallow ulceration (or at least denudation of epithelium) and subsequent cicatrisation. There will probably be a similar condition on the soft palate, and about the fauces. We may find (but not very frequently) the so-called 'ichthyosis.'

If a gumma is formed and breaks down, there will be no appreciable induration around; and the rest of the tongue does not put on a glassy œdema. The lymphatic glands under the jaw (including those lying in immediate contact with the submaxillary) will be found slightly enlarged, as they may in ordinary tertiary syphilis. They will remain, however, small, very hard, and permanently hypertrophied, and will not progress to suppuration. There will be no noticeable prominence under the sterno-mastoid. Syphilitic ulcers are characteristically painless; and the breath is not fetid with the peculiar odour of cancer. Fissures at the angles of the mouth may be present; as well as other evidences of syphilis.

In *epithelioma not arising from syphilis* we find at first an ulcer situated opposite to some source of irritation, as a projecting tooth. If very small, it will probably look healthy enough, and there will be

[1] A case in which, after excision of a minute epitheliomatous ulcer 'half as large as a threepenny-piece,' glandular infection subsequently declared itself and ultimately proved fatal, the tongue remaining healthy to the end, is reported in *Clinical Notes on Cancer*, p. 62, J. & A. Churchill, 1883.

nothing remarkable in its appearance; by degrees, the margins become indurated, and very soon lancinating pain is complained of. Later on, the remainder of the organ becomes glassy and swollen. After ulceration has progressed, there is a characteristic fœtor of the breath; the adjoining teeth become coated with a foul deposit, and ultimately loose; and the gums are spongy. Enlargement of the lymph-glands lying on the submaxillary appears very early. (To the touch the latter seems enlarged; but is probably never implicated, except by continuity of tissue.) These, however, do not become usually so hard as in syphilis, but increase rapidly in size; ultimately suppurate and discharge a thin ichor from one or more sinuses; may then form an open ulcer with deeply excavated centre, and the characteristic raised and highly everted edges. At an early period, also, the lymph-glands under the upper part of the sterno-mastoid on the same side become affected, and may yield a noticeable fulness in that situation. Unless syphilisation has previously occurred, we shall not find the typical white staining of mucous membrane on tongue, lips, and cheeks so characteristic of that disease.

The most difficult cases to determine are those in which *syphilis results in epithelioma*. One of the ulcers above described deepens, spreads, and becomes indurated around its margin; darting, burning pain begins to be felt; glassy œdema of the surrounding parts of the tongue, with fetid breath and progressive enlargement of glands, is soon seen.

But more commonly, when the patient is advanced in life and evidences of syphilisation have lasted many years, an ill-defined tumour deep in the substance of the tongue makes its appearance far back towards the root; rapidly enlarges and ulcerates, the sore presenting a characteristically irregular malignant appearance. This form is most insidious; the patient, being so accustomed to an abnormal state of the organ, does not pay much heed to the new growth till far advanced. And unfortunately enlargement of glands (especially of those situated deeply under the sterno-mastoid) sets in very early.

A very characteristic feature in the progress of lingual epithelioma, and one which will occasionally serve to distinguish it from syphilis, is the little white islands of epithelium which arise on the soft palate and on different spots on the cheeks and roof of the mouth, with which the diseased part may from time to time come in contact. It is an auto-inoculation precisely similar to that described by Dr. Foulis in some cases of malignant ovarian disease, as occurring in the peritoneal cavity.

The *microscope* unfortunately affords little or no aid in the dia-

gnosis of doubtful cases of tongue-cancer. While it may reasonably be appealed to in corroboration of an opinion already formed on independent grounds, the sources of fallacy are so numerous and so important that no surgeon may, without the utmost risk, lean solely on this instrument in order to judge whether malignancy be or be not present in any given instance. In the case of an ulcerated mucous surface there are, moreover, much weightier grounds for distrusting its authority than with neoplasms elsewhere; epithelial cells form the groundwork of the diseased structure—many of these differ little from the epithelium, which constitutes the normal covering, in outward microscopic appearance, and it is their mode of growth and distribution which must be appealed to in deciding this weighty question, rather than the condition of individual cells. It is perfectly obvious that the plan of scraping the suspicious sore, here commonly resorted to for microscopic purposes, while very objectionable to the patient, enables the pathologist to deal solely with the latter; and with the exception noted above (a syphilitic ulcer becoming cancerous) it is nearly always possible to form an accurate opinion without this.

The *simple ulcer* is characterised by its recent appearance from some obvious cause; small extent; absence of pain; absence of surrounding induration; absence of gland-enlargement under the lower jaw; healthy condition of adjoining gums; absence of foul deposit on the neighbouring teeth, other than may reasonably be accounted for by decay or by neglect of cleanliness. After the removal of the exciting cause—projecting stump or edge of tooth, usually, when the ulcer is at the edge or tip of the organ—or, in the case of the slight aphthous sores which may occur anywhere about the buccal cavity, after due attention to gastric conditions and to the general health—the lesion nearly always readily heals under the local application of a little pulv. boracis once or twice daily. Failing that result, there is cause for grave suspicion.

The *tuberculous ulcer* is not very frequently met with. Those seen by the writer have been round or oval indolent-looking ulcers with a punched-out appearance. They were absolutely painless; no induration was present around the margin; were very chronic; very slight glandular enlargement in proportion to the length of time the disease had existed was found; and the patients were otherwise tubercular. They steadfastly resisted all treatment, except excision; and the diagnosis remained a matter of some uncertainty, until confirmed by a subsequent microscopic examination detecting the presence of giant-cells, together with the absence of *globes epidermiques*, and of characteristic epithelial deposits in the neighbouring tissues.

Although subjective symptoms are in general extremely unreliable, and vary greatly, of course, with the individual idiosyncrasy; yet, in this particular instance, any complaint of *pain* in a small ulcer is of the highest importance, and at once suggests the presence of malignancy. On the other hand, a positive negation thereof goes far to indicate a favourable diagnosis. With such apparently insignificant lesions as an epithelial sore at the commencement, the symptom is necessarily slight: a little burning, sometimes darting, sensation being all the patient's trouble. Acute neuralgic pains in neck, head, and ear belong to a more advanced condition of the disease; and are only of consequence for diagnostic purposes, when the disease begins far back towards the fauces. On the other hand, a large sore which remains painless is certainly non-cancerous.[1]

When there exists reason to suspect the presence of Epithelioma, only the briefest period of hesitancy and of tentative measures is permissible; any longer delay is hazardous, and even that should hardly be recommended unless there are strong grounds for believing in a previous syphilitic taint. Whenever, after such a probationary period, doubt is still felt, the characters of cancerous disease in this situation indicate that the patient should receive the benefit of this—*in the direction of some surgical measure addressed to the extirpation of a probable cancer.*[2]

For in these small superficial sores a very trifling operation only is usually requisite; and a very slight application of the *thermo-cautery* will often avert all need for those more weighty procedures absolutely imperative, when the disease has been allowed to make much progress; and to become deeply rooted in the tissues. The triviality of the former step (painless and absolutely devoid of risk) under an anæsthetic may well be weighed against the difficulties and multiple dangers of the

[1] Neuralgic darts of pain occur soonest in epithelioma far back in the lateral regions of the tongue; and (as those parts are remote from observation) are then of value in exciting suspicion.

[2] It is obvious that no such tentative treatment can be held valid without the previous removal of any manifest mechanical exciting cause.

latter, with its too frequent failure to procure ultimate immunity ;—still more against the extreme suffering inseparable from death by this disease.

Again, the indiscriminate use of *nitrate of silver* in these cases is greatly to be deprecated, and, there can be no doubt, often goes far to bring about the very catastrophe it is intended to avert. The remedy is most useful for small chronic syphilitic lesions, but for no others. Its employment should be restricted to such, and never resorted to when there exists the least suspicion of malignancy. In the latter, the effect is far too superficial to result in good ; and the chronic irritation of repeated applications is exactly the one thing most needed to cause epithelioma. For non-specific sores or excoriations it would be far better to discard the nitrate altogether.

When the thermo-cautery is resorted to, it is always desirable to use it as *a cutting instrument* ; that is to say, not by merely dabbing the hot blade against the diseased surface, but by excising all the morbid together with a small margin of (apparently) healthy tissue. The former method is liable to exactly the same objection as lunar caustic—that of being too superficial in its action ; the latter effects a clean removal of everything suspicious, does not usually cause any hæmorrhage ; and the resulting wound heals rapidly. A very thin slice thus shaved off is sufficient in recent cases.

With regard to the use of the thermo-cautery, a word of caution is, however, necessary. It should never be used for the excision of any *large* portion of the tongue, especially when far back within the mouth. Very severe and possibly uncontrollable hæmorrhage is then apt to occur during the operation. For such cases, the *galvanic écraseur* is by far the best instrument.

Epithelioma commencing in the *posterior regions of the tongue* (particularly at the side of the organ in immediate juxtaposition to the pillars of the fauces) needs especial remark. It is here prone to attack the cervical glands (and particularly those deeply situated on the large blood-vessels, which are so important as regards the prognosis) at a much earlier period even than when arising further forward in the organ. The

origin of the lesion at a spot often out of sight, at least until the laryngoscopic mirror is used; its visual insignificance even then—a little indurated nodule, with some puckering of the adjoining parts—being frequently all that is discernible until the disease has made considerable progress; the fact that the part is not so much exposed to irritation by the teeth, or food—so that the patient hardly notices, and makes little or no complaint of local soreness,—greatly heighten the ordinary difficulties of diagnosis and render the cancerous deposit peculiarly insidious. Not uncommonly, the patient seeks advice for acute neuralgic pains of the cheek or side of the head, with or without persistent ear-ache; and only close questioning elicits the presence of a slight uncomfortable sensation at the back of the tongue, probably with some trifling difficulty in deglutition.

The best safeguard consists in vigilance, especially when the patient is of mature age (though the disease is by no means confined to these). Persistent neuralgic pains, shooting up the side of the face and into the ear—not assignable to the presence of decayed teeth or teeth-stumps—differing from ordinary neuralgia of this locality in not yielding readily to remedies (such as butyl-(croton)-chloral hydrate, with gelsemium) should at once excite suspicion of the real nature of the case; heightened when it is discovered that the individual has some slight throat trouble. A careful examination by the finger should at once be made; when the small puckered induration above alluded to will probably be detected, and it will be found that this bleeds readily when touched.

Free extirpation by the *galvanic écraseur* would appear the best method of treatment. It is dangerous to use the thermo-cautery in a part so remote; it is difficult to secure complete eradication, as the disease tends to spread not only into the tongue, but into the pillars of the fauces, tonsils, etc.; and deposit in the lymph-glands we can feel, usually signifies that those deeper ones we cannot, have already received cancer-germs. In any case, therefore, the prognosis in these distressing cases is very gloomy; the only hope lying in

free removal while the complaint is recent and superficial. In many instances extirpation of the whole organ will contribute materially to prolong the sufferer's life and to advance his comfort, but will hardly do more than this.

The above remarks upon commencing tongue-cancers will also hold good as to *Epithelioma commencing in other parts of the buccal cavity*, a certain reservation being necessary in the case of sores on the *Lips*; where the malignant process is ordinarily (although exceptions are encountered) much less rapid and acute than in the former organ; where, hence, a longer time for tentative treatment may fairly be allowed; and where the ultimate operations demanded are less critical and less radical.

When Tongue-Epithelioma has persisted many weeks, or has obviously become deeply rooted in the tissues, more severe measures will of course be required. Provided that the infiltration is comparatively superficial and far from the central raphé, the removal of half the organ will be sufficient (the secondary lymph-gland deposits being here a greater obstacle to a resulting cure than the primary mischief). But, failing these conditions, excision of the whole is demanded. And if any doubt exist as to the preferable course, the patient should unquestionably receive the benefit—*i.e.* the more radical operation (considering the consequences involved) is infinitely more to his advantage than the minor. Little greater risk (if any) is thus incurred; the possibility of hesitation points to the likelihood of extension beyond the raphé having already taken place; and, in the event of local re-appearance, the sufferer is in a much better condition after the complete excision than after the incomplete.

On the other hand, the consequences of the mutilation involved are much less severe than might have been expected, are often even trifling; deglutition is not interfered with, and persons frequently express surprise at the ease with which they can articulate.[1]

[1] The popular idea is that without the tongue speech is impossible. The existence of such a belief is not without importance, as it seems often largely to prevent the subjects of tongue-cancer from undergoing operation in time to be of much practical use; or, indeed, any operation at all. One of the most cele-

In the *choice* of operative measures (the object being of course to effect the greatest permanent good at the minimum of risk, immediate or prospective) it is requisite to consider what are the principal dangers of operations on the tongue, and how these may best be obviated.

The *immediate* risks encountered arise principally from *hæmorrhage*, which again may be serious from its amount and from the operator's inability to control it; or, in the second place, from the lodgment of clots in the aperture of the glottis. In a cavity difficult of access, and whose recesses are obscure, surgical procedures are never easy; under such conditions as a dark room, a badly fitting gag to separate the jaws, and a patient (often a strong muscular man) insufficiently under the influence of an anæsthetic and struggling violently, the impediments are considerably heightened; and this not only as regards the control of hæmorrhage, but also in respect of the removal of diseased tissue.

The production (and maintenance) of *complete anæsthesia* is the first consideration. Two points may be noted in respect of these cases: (*a*) Vomiting hardly ever takes place during the operation or subsequently, the probable explanation being that by the frequent application of sponges to the fauces the patient is prevented from swallowing saliva. (*b*) When the case is advanced, when the parts at the root of the tongue are infiltrated, and the deep cervical lymph-glands enlarged, the anæsthetic is usually taken badly, and temporary stoppage of the respiration is no infrequent occurrence, although, fortunately, rarely or never lasting.[1]

brated miracles of the early Church was that of the 'Six (?) thousand confessors of Africa' (referred to by Mr. E. H. Lecky) whose tongues were cut out in some persecution, and who yet were able subsequently to talk.

After complete excision of the organ, speech is at first somewhat thick; but the defect is greatly lessened by time, and may almost entirely disappear. A man, whose tongue had been excised some five years previously, recently appeared in the out-patient room of the Cancer Hospital, and conversed there for several minutes, no one present entertaining the slightest suspicion of the deficiency, until the patient himself declared it. Hardly a vestige of the tongue was visible in the mouth cavity, and there had been no re-appearance of cancer.

[1] The administration of ether by a Clover's inhaler, with the subsequent maintenance of unconsciousness by chloroform given in a Junker's apparatus, would seem the most efficient plan in these cases.

The next two requisites are a good light; and a well-fitting gag,—the prongs of which are long enough well to clasp the gums. Most in use are too short in this respect, and apt to slip off. It is often advantageous to use two, —one on each side. An electric or other serviceable lamp should always be in readiness. Lastly it may be remarked that to approach any operation on the mouth, short-handed, —is a proceeding, especially hazardous; and likely to be followed by unsatisfactory results.

The above conditions being complied with, any vessel which bleeds during the operation can be readily secured by Spencer Wells' long torsion-forceps, curved or straight,—a supply of which should be in readiness; and must be ultimately ligatured. Any clot lodging in the glottis-aperture can be readily dislodged by the finger, provided that the possibility of the occurrence be remembered; and provided especially that a due watch over the patient be maintained until complete recovery from the anæsthesia. At the same time, if vomiting happen to take place, the possibility of a morsel of food becoming lodged in the same locality must be remembered.

Pressure with the thumb on the carotid artery will temporarily arrest arterial hæmorrhage, of which the source cannot be immediately ascertained. As a last resort ligature of the common carotid is indicated; but will very rarely become necessary. If there exists any great probability of compulsory resort to that step (much more often requisite when the jaws, pharynx, &c., are concerned, than with tongue-cases), Mr. F. Treves' practice of encircling the artery with a loop of catgut, which can be tightened at will, is a useful preliminary step.

The *more remote danger* prospectively involved,—apart from the ordinary risks attending any surgical operation,—is *the subsequent supervention of pneumonia.* Any serious loss of blood from whatever source apparently predisposes to inflammation of the lungs; but in operations on the tongue, there exists a special additional cause, viz. the passage of

blood, mucus, sanious or purulent matter from the ulcer, fragments of the malignant growth, &c.—down the trachea at the time of operation. The organ must throughout necessarily be dragged as far forward as possible, a loop of silk threaded through the tip being by far the most convenient means of securing that end. The epiglottis is thus tilted completely forwards ; and the aperture of the glottis remains wide open, so long as the traction is continued.[1]

Beside the source already pointed out, prolonged anæsthesia tends to produce pneumonia by the depression which ensues ; there is also the risk of chill ; and, apart from the local presence of blood and septic material in the bronchi, any considerable hæmorrhage predisposes. It is important therefore to select that plan of operation likely in the first place to be attended by the *smallest possible loss of blood* ; in the second, *occupying the shortest space of time.*

The former object is occasionally sought by a preliminary ligature of one or of both lingual arteries (accordingly as half the tongue, or the whole organ require excision). However well this step fulfils the first of these conditions ; it

[1] Whatever other method of securing patency of the glottis under anæsthesia may be preferred (and Dr. Howard's plan appears one of the most efficient) ; there can be no question that the old-fashioned practice of dragging the tongue forwards well attains the same object. Some years since, the writer was led to examine this point, in connection with the mode of tongue-excision here described ; he then found (and the observation has lately been again verified in the mortuary) that, in the dead body, the epiglottis readily responds to *firm* traction, applied by forceps at about the insertion of the frænum, (so not too near the tip). Anyone can easily satisfy himself of this ; if the jaws are prised open, the forefinger of the left hand passed down to the fauces, and the tongue jerked or pulled out by forceps held in the right, the epiglottis will be immediately tilted far forwards, and the aperture of the glottis become widely open. Directly the traction is relaxed, the organ reverts to its former position ;—apparently by the pressure, downwards and backwards, of the weight of the tongue (the body lying on its back). It may be remarked that personal experiments, or even experiments on the living, do not count, in the investigation of this question ; an anæsthetised person is passive, is practically in the condition of a dead body ; and the matter can be fairly considered and examined into, only by means of the latter.

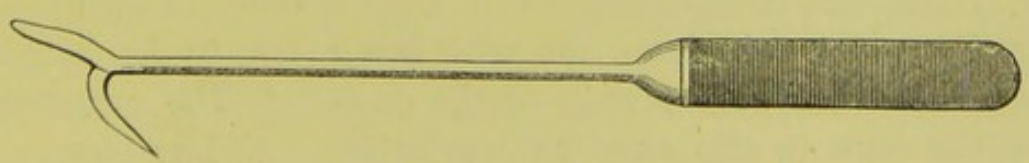
The point is particularly important in connection with these tongue-operations. The necessity of holding the tongue forwards, keeps the aperture of the glottis widely patent throughout ; hence more or less blood, &c., is apt to trickle down into the trachea and bronchi, and to set up a septic pneumonia. It is therefore specially requisite to avoid all unnecessary bleeding.

assuredly does not comply with the second. Owing to the small size of the vessel, the operation for its ligature, even in practised hands, is difficult and tedious, usually greatly prolongs the period of anæsthesia,—and is not attended by any advantages commensurate with the added increment of danger.

The method of excising the tongue which (besides appearing much the best in other ways), usually causes the smallest amount of hæmorrhage is by the use of the *galvanic écraseur*. It is employed as follows :

The patient having been completely anæsthetised, the mouth is prised open and the jaws separated as far as possible, by a well-fitting gag on each side, held subsequently in position by assistants. The tip of the tongue is then seized and drawn forwards by tongue-forceps ; a curved needle threaded with a long piece of strong silk is passed through the septum at about a third of an inch from the tip ; the silk is caught by a pair of dissecting forceps, the needle immediately withdrawn, and the two ends passed through the loop ; the organ is subsequently throughout the operation, pulled as far forwards as possible, by an assistant, who holds the ends of the silk. The next step is to free the lower attachments of the tongue, including some of the fibres of the genio-hyo-glossi ; this may be accomplished with scissors or the knife, but acting on the principle of avoiding loss of blood as far as possible, is best effected by the cutting blade of a Paquelin's thermo-cautery. Any bleeding vessels may be caught up and temporarily secured by short Wells' forceps.

The next step is to pass the loop of the galvanic écraseur well over the tongue ; then to secure it in the proper position by the insertion of the ordinary curved needles in handles, passed either from below upwards through the substance of the organ, and completely perforating this ; or of handled needles of the shape here represented



passed from above downwards for a short depth into the muscular tissue, up to the shank. Unless this be done, the wire is extremely prone to slip ; directly the needles have been introduced, it should be pulled taut, and the loop-holder fitted into the body of the instru-

ment ; to which the wires of a Grove's battery have been previously adjusted. A lip-retractor of metal, bone, or vulcanite having been applied over the lower lip ; and straight bone spatulæ being at hand, to protect the upper in case of need ; contact is effected by screwing down the button, and the actual process of excision commences. Care should be taken not to effect this too hastily, otherwise there is no gain in respect of the avoidance of bleeding ; the most important point to be regarded is to have the wire heated just enough to burn through the parts continuously and slowly, but no more. Usually two cells of the Grove's battery will be sufficient to bring into play ; with four, the current is far too powerful, and free hæmorrhage will assuredly take place.

With the latter precaution, the whole of the tongue is often radically extirpated with the loss of hardly a drop of blood. In any case there is rarely any bleeding until the parts are completely severed, and a clear view can be obtained. If then, the divided lingual or other arteries give trouble, they can be readily secured by long Wells' forceps, and ligatured. A plentiful supply of sponges on sticks or holders should always be in readiness.

A very useful resource here or elsewhere in cases of hæmorrhage, venous or otherwise, whose source cannot be readily ascertained, is to tie a small piece of iron-lint (lint which has been well soaked in strong liquor ferri perchloride, and then dried) around a stick-sponge ; and to keep the latter then firmly applied for a minute or two, to the part. Two or three stick-sponges thus prepared, should be prepared beforehand ; and the successive application of these rarely fails to overcome the difficulty.

The chief precautions needed in the use of the galvanic écraseur are (as above stated) first and foremost not to bring too many cells of the battery into the current ; to accurately adjust the wire before making contact, and to carefully shield the lips from injury by the heated stem.

Attendant disadvantages are : 1. Difficulties in accurately applying the wire-loop, the wire being apt to be caught by teeth or by the prongs of the gags. 2. The proneness of the wire to slip after its application. 3. The time lost in adjusting the loop-holder to the body of the instrument, and in making the wire taut. 4. The weakening of the electric current, by guiding-needles applied too closely, or in too great a number ; or again by hæmorrhage, usually due to laceration

of the diseased parts by the struggles of a patient imperfectly anæsthetised. The blood then often fills up the conducting-tubes of the wire-loop. The first two of these, as well as the last-mentioned, are best obviated by securing complete anæsthesia, and by providing efficient assistance; for the remainder, we must look to the instrument-makers. As at present in use, the galvanic écraseur would seem much more cumbrous than it need necessarily be; we want some device for fitting the conducting-tubes of the loop instantaneously into the body of the instrument, and another for quickly hauling the loop taut when that has been done,—without either the awkwardness of having to drag down the wires with the hand and then to screw them into position; or of having tediously to screw down the handle, and then to re-adjust the whole. Again if guiding needles capable of piercing the tissues could be made of some non-conducting material, such as wood or vulcanite (insulating the wire with gutta-percha is obviously useless); it would be a material gain to the efficiency of the écraseur.

With all these drawbacks (which will doubtless some day be remedied), the writer believes the plan of excising the tongue here advocated to be superior to any other for the following reasons:—

I. The attendant hæmorrhage is less than by any other method; may be practically *nil*. This signifies a satisfactory and thorough operation, going very far to prevent ultimate re-appearance of the disease; less shock to the patient; less chance of secondary pneumonia, septic or otherwise.

II. After the extirpation has been effected, an eschar remains, sealing up as it were for a few days, the divided absorbents and bloodvessels; so preventing septic infection by this channel, with its attendant risks of pyæmia, septicæmia, local cellulitis, &c., during the most critical period of recovery from the depressing effects of the operation. The eschar then rapidly peels off, and, under suitable treatment, the resulting sore heals very speedily. In a situation so difficult of access as are the parts about the root of the tongue, the portion of burnt tissue left behind in the form of eschar, by way of addition to the amount directly removed, is by no means without

importance, as tending to secure complete eradication of cancer-germs.

III. Provided that the platinum wire has not been too greatly heated, that the removal has been conducted with sufficient deliberation, and the parts have not been lacerated before the electric current was applied,—there is little or no risk of *secondary* hæmorrhage, at the separation of the eschar, or subsequently. Any bleeding of consequence at the former period is most unusual,—unless brought about by some carelessness.

The galvanic wire may occasionally be employed with advantage by Nunneley's method; of making a preliminary perforation with a curved bistoury, in the middle line of the neck, about half an inch below the lower jaw, and bringing the point of the bistoury out within the mouth just in front of the *frænum linguæ*. The guiding-loop threaded with platinum-wire, of the écraseur, is passed up by the channel thus made; the wire caught with dressing-forceps, dragged up until a loop is obtained sufficient to encircle the tongue, or the part to be removed; and the remainder of the operation conducted as above. It is doubtful whether this plan, (beside the disadvantage of causing a slight additional wound), is in any way more efficient than the former, when the tongue alone is to be removed; but it is occasionally preferable, when the floor of the mouth is implicated.

When only *half* the organ needs excision, Mr. Morrant Baker's method is most serviceable. A curved needle threaded with strong silk is passed through the anterior portion of the tongue a little on one side of the middle line, and a third of an inch from the tip; the loop is caught, the needle withdrawn, and the ends of the needle passed through the loop. The same having been repeated on the opposite portion of the tongue an assistant on each side takes hold of a thread; an incision is made along the dorsum, and down to the frænum, through the mucous membrane alone. Firm traction being made in opposite directions, the tongue readily splits into two halves; the process of division being at the same time aided by the fingers of the operator. The diseased

portion should then be removed by the galvanic wire-loop applied as far back as possible.

The multitudinous other operations which have been invented for securing the same object are all more or less liable to the defects which have been pointed out; prolonged anæsthesia, shock, embarrassing and dangerous hæmorrhage, &c. In particular, those extremely formidable procedures by which the lower jaw is divided; or by which a very extensive separation of the muscles attached thereto is effected; are greatly to be deprecated. If these succeeded in effecting the object they propose, of securing a more radical removal of the cancerous tissues, together with (as a necessary sequence), smaller risk of 'recurrence,' something might be said in their favour; but that does not seem to be at all the case. As a general maxim in dealing with malignant disease anywhere, *it never pays to undertake heroic operations.* Unless there is a fair chance that the malady will be effectually rooted out by an operation not specially critical or dangerous (hip, thigh, and shoulder-joint amputations being perhaps excepted); it is utterly useless, as a general rule, to subject the patient, in the hope of procuring permanent immunity, to any surgical procedure which places life in imminent danger; we may be almost absolutely certain that, however favourable the immediate results, the disease will speedily re-appear.[1]

Concurrently with removal of the primary lesion, it is needful to consider the structures implicated, or likely to be

[1] The writer's colleague, Dr. F. A. Purcell, advocates an operation (the 'Hyo-glosso-Epiglottidean') which is advantageous, when it is essential to excise the tongue very near its root. After a submental incision, he passes a Wood's hernia-needle threaded with whipcord into the right glosso-epiglottidean pouch, hooks up the loop and draws it out of the mouth; withdraws the needle and repeats the manœuvre on the opposite side. An end of the platinum wire of a galvanic écraseur is then caught by each loop of whipcord and by traction on the latter is pulled out through the sub-mental incision; the wire thus lying on the base of the dorsal aspect of the tongue, just in front of the epiglottis. The wire is then adjusted to the remainder of the instrument; and the tongue divided vertically, in the manner already described. The tissues in front of the vertical groove are subsequently cut through with scissors.

(It would probably be preferable to complete the operation by a second adjustment of the platinum wire; as the lingual arteries are apt to escape division in the first instance,—subsequently to give rise to troublesome hæmorrhage.)

implicated secondarily ; and to ensure the obliteration of the latter, whenever possible.

Epithelioma attacking the tongue (an organ composed of soft, and loosely-cohering tissues, plentifully supplied with lymphatics and blood-vessels)—as has been remarked, quickly infects the adjoining lymph-glands, (more rapidly, it is believed, than any other local malignant deposit, as a general rule). When the anterior part of this organ, or of the floor of the mouth becomes the seat of disease ; the first lymph-glands to receive secondary infection are those under the lower jaw, in immediate contact with the sub-maxillary—on the same side, as the cancerous ulcer. Eventually, the fact is made manifest by enlargement and by tenderness on pressure. To the touch the sub-maxillary gland itself seems enlarged ; but this is never the case in early stages, and until the infiltration extends to this organ, by contiguity of tissue.

Cancer-cells and nuclei being of extremely minute size, there will be no apparent enlargement until these have considerably increased and multiplied in the meshes of the lymph-gland. A stage of *tenderness on pressure* precedes that of increase in bulk ; and as it may reasonably be assumed that a single cell or nucleus is sufficient to constitute the germ of a secondary tumour-formation, a period during which there is no palpable indication of infection—must necessarily precede the last-named.

In view of the early emission of these secondary germs, and of the notorious fact that it is extremely rare to meet with a patient in whom the lymph-glands under the lower jaw, have not already been attacked—as subsequently evinced by 'recurrence' in the latter ; it is almost invariably the safest plan to assume that the phenomenon has taken place—even when the symptoms characteristic thereof are altogether absent ; and accordingly to remove these glands at the same time as the primarily diseased area.

From their diminutive size it is not always feasible to effect this without at the same time excising the sub-maxillary gland ; to which the lymph-glands in question are closely contiguous. It is better of course to avoid abstracting the

submaxillary, if the latter organs can be thoroughly cleared away without so doing; but failing that, the additional removal adds apparently nothing to the gravity of the little operation, and usually ensures more efficient obliteration of the lymph-glands in question. The facial vessels may be first dissected out; or if unavoidably wounded, are easily ligatured.[1]

When the lymph-glands under the lower jaw have undergone increase in bulk; there can be no question of the necessity for their removal with the least possible delay. The physical indications of this occurrence are apt to differ somewhat from those presented to lymph-gland enlargement in other localities. Instead of the separate and distinct round nodular tumours there usually met with; a more or less ill-defined induration is encountered; the impression conveyed on examination in a recent stage, being that the lesion consists in a hypertrophy of the sub-maxillary gland here situated. This appearance results from the close juxtaposition of the lymph-glands to the sub-maxillary; and from the dense fascia by which both are invested.

Should extirpation not be complete, the cicatricial tissue resulting from the incisions for removal of these organs, will contribute to impede the subsequent development of any residual cancer-particles.

The only conditions which preclude removal of these lymph-glands are—

[1] The following case may be referred to as an example of the success of this practice. Mrs. G. —— seen April 8, 1886. A widow lady had lost husband four years previously; then much mental anxiety. Age sixty; good general health. For previous four months, an ulcer as large as a sixpence, with indurated edges, far back at right edge of the tongue; caused by friction against a projecting tooth. For past few weeks, lancinating pain, worse at night, shooting up into the ear. Slight tenderness in region of right sub-maxillary gland. On April 14 the diseased area excised with the cutting blade of the thermo-cautery; a projecting tooth being removed at the same time; also the right sub-maxillary gland, with tissues adjoining; no palpable lymph-gland deposit.

The patient has had no further trouble; and is now (December, 1889) in good health. To Dr. R. A. Gray, of Blackburn, who kindly sent the case to the writer; the latter is indebted for the designation, 'Anticipatory Method.' The ordinary career of tongue-epithelioma proves that deposit in these lymph-glands, even if not yet sufficient to cause their enlargement, must be assumed as a matter of course after a duration of four months.

(*a*) An advanced stage of the lingual disease; so that an operation is undertaken only for palliative purposes.

(*b*) Implication of the deep cervical lymph-glands, in contiguity with the large bloodvessels; and situated under the sterno-mastoid muscle on the same side.

Of palliative operations for tongue-cancer, it may be remarked that this disease tends to shorten life in respect of certain characteristic features, more or less absent in malignant affections of other parts of the body. Such are (*a*) the peculiarly agonising neuralgic pains above alluded to; (*b*) the impediments in the way of the proper ingestion of nourishment, partly due to difficult deglutition,—partly to the suffering caused by passage of food over the raw surface; (*c*) the inhalation of fetid gases, and the swallowing of foul secretions, resulting from the gangrenous conditions which ultimately prevail; (*d*) salivation.

It is therefore right to hold this an exception to the general rules forbidding operations, which involve no more than a partial excision of cancerous parenchyma; and with the reasonable prospect of prolonging life, and of ameliorating suffering, to counsel extirpation of the tongue, even in advanced stages of the infiltration;—whenever that measure can be carried out without special immediate risk to life.[1]

Removal of the deep cervical glands (under the sterno-mastoid muscle), cannot be approached without a much deeper sense of gravity than is the case with those under the lower jaw. (As above remarked, when cancer commences far back at the root of the tongue, or about the fauces, the former are the first to receive infection; in such cases it may be held the second stage of the complaint,—in cancer of the anterior part of the tongue, or mouth, the third.)

When these are found enlarged, the symptom is an almost invariable indication that still deeper chains are also diseased;

[1] No cutting operation can obviously ever be recommended in these advanced cases, when the patient is often extremely debilitated; and when even a moderate loss of blood might prove fatal. Extirpation by the galvanic écraseur however affords a fairly safe and bloodless method of affording great relief under these circumstances;—as also in persons of advanced age.

whereof some lie in contact with the base of the skull—others in close contact with the trachea and œsophagus. Eventually the lymphatic vessels also become distended with granular white plugs of the morbid epithelium.

The more superficial ones moreover are closely adherent to the thin sheath of the internal jugular vein ; and that vessel may very readily be torn in attempts to remove them. Although re-section of a portion of the vessel has been performed, the presence of deposit in still deeper tissues forbids any prospect of benefit from such a measure.[1]

As an almost invariable rule, a single lymph gland obviously increased in size before an operation ; is the index of deeper ones in a similar condition ; but in which the enlargement could not previously be detected by the touch. Infection here when once set up, proceeds from gland to gland with great rapidity.

For these reasons, secondary deposit in these deep cervical glands may be justly regarded as denoting an advanced stage of cancer-progress ; and it is rarely advisable to attempt their removal, when abnormal enlargement exists.[2]

IV

EPITHELIOMA of the Lips in the great majority of instances affects the male sex ; and the lower lip is attacked more frequently than the upper.

The causes are identical with those of tongue and mouth-cancer,—a generally lowered vitality and chronically morbid condition of the mucous membrane predisposes,—some

[1] Some years since, about an inch of the internal jugular vein was thus excised by the writer, for a re-appearing lip-epithelioma seemingly limited to lymph-glands intimately adherent to that vessel. The patient made a good recovery, but the growth subsequently manifested itself in the lymph-glands lower down the neck.

[2] The 'Anticipatory Method' of excising the deep cervical glands, before enlargement has taken place is rarely possible in cases of cancer commencing near the root of the tongue, and about the pharynx ; inasmuch as the gland-condition is commonly the first symptom which creates suspicion.

mechanical irritant, acting continuously for a longer or shorter period, excites.

In addition to those noted in the former; the direct contact of the usual smoking apparatus with one of the cracks or fissures to which all are more or less liable, is a familiar generator of lip-cancer; second in importance, however, it is believed to projecting spikes of broken or decayed teeth.

Syphilitic conditions moreover do not appear to pass into malignant ulceration, so frequently as in the case of the tongue.

Provided that the history is well known, and that there are concurrent evidences of syphilis elsewhere present, the diagnosis between syphilitic and malignant ulceration is usually easy.

In primary syphilis, the age and circumstances of the patient; recent duration; and inflammatory area immediately surrounding the roundish indurated sore, awaken suspicion. In tertiary ditto, this indurated edge common to malignant disease, and to the preceding is absent; the most important local characteristics are the presence of several distinct areas of ulceration; and of white patches scattered here and there over the buccal mucous membrane.

Lip-cancer is, as a general rule, a far more chronic and curable disease than when the tongue is attacked; and the consequences of delay in treatment are much less irreparable and disastrous. In a large number of instances, no reappearance is encountered, after simple excision by the usual method.[1]

There is however considerable variation in the degree of acuteness evinced by different cases; even when malignancy is undoubtedly present. Many sores infiltrate rapidly; and infect the lymph-glands (those in contact with the submaxillary) at an early period. Although then the simple V-incision is often curative; it is not safe to rely upon this

[1] Mr. Butlin ('Operative Surgery of Malignant Disease,' p. 113) gives the percentage of success (presumably after a V-incision) without removal of lymph-glands,—as thirty-eight per cent.

without subsequently causing the patient to re-appear for examination at brief intervals (for the next two years).

Much obviously depends upon the recency of the case; and upon the rapidity with which the disease is manifestly progressing. As a rule, the younger and more robust the individual, the more speedy (it may be anticipated) will be the advance of the malignant process (when once unmistakeably established).

Numerous sores on the lips however linger as it were, on the border-land of malignancy for many years. (This well-known fact is rather apt to cast doubt upon the statistics of successful operations.) Although repeatedly scabbing over; or partially cicatrising, and breaking out again; no true cancer-proliferation seems to ensue until the individual becomes old, or until injudicious caustic applications have irritated the lesion. Of these, the use of silver-nitrate, has already been deprecated.

In such, the excision of a thin wedge of tissue by the thermo-cautery will usually prove curative; and prevent the almost assured ultimate supervention of cancer. And in all cases seen at an early period, it will be right merely to cut away the growth,—taking the precaution, to remove a sufficient margin of seemingly-healthy tissue;—to remove any exciting cause, such as a broken-tooth process, in the immediate vicinity,—and to maintain a close subsequent watch (for the period indicated) over the dangerous lymph-glands.

Whenever however infection of these organs may with probability be inferred,—whenever the cancerous infiltration is of long duration, or is obviously of an acute character,—it will be much safer, at once to remove the latter on the side of the disease (with or without the contiguous sub-maxillary). When enlargement is already found, the operation will be necessarily incomplete without that step.

The V-operation is usually so safe and satisfactory, and the subsequent healing process so rapid, that any other mode of extirpation hardly requires consideration. The use of caustic 'pastes,' especially, in such close proximity to a highly absorbent mucous tract, is not devoid of risk.

As the excision of a wedge-shaped piece in this manner is commonly attended with free hæmorrhage,—which, although not sufficiently incontrollable to produce danger to the patient, is often very troublesome to the operator,—it is advantageous to secure the services of two assistants ; one of these to compress with his thumbs, the facial arteries against the lower jaw,—the other to maintain with polypus-forceps compression on either side of the V,—until the diseased part has been removed.

Extensive infiltration of the lower jaw seen in very advanced cases, indicates a stage in which benefit can hardly be anticipated by surgical measures. Removal of portions of the bone can however be undertaken with much better hope of success, (when the disease is limited to these)—than when the primary lesion was a Tongue-epithelioma.

In very widely-extending sores of the lower lip, it may be requisite to pare off the whole of that structure ; using hare-lip pins to restrain hæmorrhage,—but without any endeavour to secure immediate union. The subsequent healing process is almost always very rapid ; and the temporary deformity repaired by Nature in a surprisingly complete manner (without occasion for resort to a plastic operation). In such cases, extensive lymph-gland deposit is always met with ; the prospects of success by removal of the glands under the jaw depending chiefly upon the condition of those in contact with the large blood-vessels,—unhappily almost invariably then implicated.

V

Of Sarcomatous growths about the mouth, it may be remarked that the acute Round-celled Sarcoma tends to produce a fatal result more by exuberant local growth, than by secondary infection ; that very wide removal of contiguous tissues is thus indicated, whenever it is feasible to attempt eradication ; but that it is rarely possible to attack these rapidly-advancing, and deeply-infiltrating growths, in time to effect

more than temporary benefit,—and without considerable prospect of (local) re-appearance.

With Spindle-sarcomata, however, the case is altogether different. These tumours often commence on the gums, as growths of well-organised fibrous tissue ; presenting no malignant characteristics, either before removal, or upon microscopic examination ; and with an obvious causation by the agency of some diseased tooth,—to which an epulis is almost always closely contiguous.[1]

The local inconvenience of an epulis mostly results in its removal, at an early period. The same pathological phenomena, as in the case of warts on the skin, are then prone to ensue. After radical extirpation, no re-appearance of the growth will follow ; if only partial removal is effected, (as by the ligature), a fresh tumour-formation is quickly seen ; and after several such, the presence of malignancy becomes gradually manifested, by pain, deep infiltration,—and rapid progress.

In attempting the obliteration of an epulis, however insignificant in size, it is necessary,—(in addition to removal of the exciting cause,)—to secure complete destruction of the pedicle ; and of a margin of alveolar mucous membrane contiguous to this. In very mild cases, it is sufficient to snip off the little growth with scissors,—to arrest hæmorrhage by pressing a small pad of iron-lint against the wound,—when this is completely arrested, to dry the parts, and cauterise the base thoroughly with nitrate of silver.

With larger tumours, or after the latter plan has been tried unsuccessfully,—it is necessary to place the patient under the influence of an anæsthetic,—to sear off the tumour with the thermo-cautery ; and at the same time, thoroughly to destroy the tissues about the point of origin.

Without subsequent application of caustic, it is hazardous to remove the neoplasm by scissors, or ligature. As with skin-warts, those methods *may* prove successful ; but the chances are in favour of subsequent re-appearance,—and of accelerated progress towards the malignant proliferation.

[1] The mode of excitation is not however, as with epithelioma—ordinarily mechanical ; but rather inflammatory.

As probably every such growth, if long unmolested will thus become truly cancerous; it is best to effect complete obliteration as soon as possible after the discovery of the tumour.

When there can be no question of the presence of the cancerous process, however, the latter is still comparatively slow in progress, and long remains localised;—so that, with good prospects of success, removal may be attempted when a considerable amount of disease is obviously present,—and only a limited ablation of seemingly-healthy tissue, beyond the limits of the palpable tumour-formation, is essential to the cure.

The following case may be cited:

Charles M., aged 51. Admitted into the Cancer Hospital, November 22, 1886. Brother died of cancer on the hand; no other cancerous relatives.

According to the history given a small epulis had formed on the gum six months previously; in three months this was excised, several teeth being extracted at the same time. Symptoms of continued growth however were almost immediately apparent.

On admission, the anterior part of the body of the lower jaw was found much thickened by an ulcerated infiltration, for a space of two inches at the symphysis; between the latter and the insertion of the frænum linguæ, was a rounded hard nodular mass, about an inch in diameter. The glands on both sides were enlarged and tender. The growth was central; but extended further along the alveolus on the left side, than on the right. Several teeth had here been extracted, only slight pain was felt; but a sensation of numbness was described.

General health good. Tongue healthy, and its movements unrestricted.

The thickened bone, ulcerated mucous membrane, and adherent glands gave the case a very malignant appearance; and had ordinary epithelioma been the disease, no operation could have been of the least service. The history however; and the absence of pain, pointed out the true character of the complaint.

Partial excision of the lower jaw was accordingly performed; the bone being divided on the left side, immediately below the coronoid and condyloid processes; on the right, a little lower. With the body of the jaw was removed an adherent nodular tumour, more than an inch in thickness, and extending backwards in the middle line from

the symphysis ; it filled all the front part of the floor of the mouth, and appeared to be a mass of lymph-glands,—although no lymph-gland tissue could be found on microscopic examination. The morbid growth was found to consist wholly of embryonic spindle-cells ; no myeloid corpuscles were present.

The patient made a good recovery, with little deformity. For two months subsequently, his only trouble was constant dribbling of saliva ;—for which he was compelled to wear a sponge-apparatus of his own invention. By April 1888, this had ceased. When last seen (October 21, 1889) the man was quite well.

Many spindle-sarcomata of the jaws contain myeloid corpuscles mingled with the embryonic spindle-celled tissue ; but the presence of the latter is not known to have any special bearing upon their progress,—i.e. the clinical phenomena do not differ from those of cases wherein the spindle-cells alone are present.

VI

CANCER of the Female Breast most commonly results from malignant proliferation of the acinar epithelium, (within the meshes of the normal connective tissue of the part,—whereof the stromal arrangement of the white fibres chiefly contributes to confer on it the familiar alveolar microscopic appearances).[1]

The chronic cases are classed as Scirrhus ; the acute may with convenience, be termed Encephaloid cancer ; the latter being only however, an exuberant and rapidly-advancing form of the former. There is no distinction of species ; and between the two extremes, examples shewing every gradation are encountered. Very frequently in the same specimen, a thin section from one part, shews under the microscope, typical scirrhous characteristics ; whereas, another from a different portion, evinces those formerly described as denoting 'soft,' 'encephaloid,' or 'medullary,' cancer.[2]

[1] The most typical alveolar characters are seen where fatty tissue has been replaced by the cancerous parenchyma. In a thin section, which includes some of the former, the process can readily be traced. That any *entirely new* formation of fibrous tissue ever takes place in connection with this neoplasm, is (to say the least) extremely doubtful.

[2] The term 'scirrhus,' as applied to malignant growths, evincing a certain degree of hardness is vague ; and as leaving out of sight, the question of their

Less frequently, malignant growths in the mamma are of connective-tissue origin; to be then usually classed as 'spindle-celled sarcoma.' True round-celled sarcoma is very rare; 'colloid' and 'osteoid' cancers are similarly exceptional varieties; and the same may be affirmed of 'melanotic sarcoma,'—although microscopic or even macroscopic deposits of pigment are not very uncommon in association with scirrhus.

At their commencement, cancerous neoplasms bear a considerable resemblance to non-malignant tumours; moreover many of the latter class tend ultimately to develop the malignant process. One species in particular (cysts) appears almost certain to do so; if the patient's life be prolonged to old age.

The diagnosis of a non-malignant from a malignant mammary growth, is often therefore, a matter requiring very careful investigation, and judicial balancing of evidence; so that, on the one hand there shall be no risk of unnecessary operative measures,—on the other, no time may be lost when the malignant process has actually become established.

The age of thirty-eight, affords a very useful, though rough practical guide. A *prima facie* presumption may be entertained that any breast-tumour first appearing long before that period of life, is benign; any such, at or after this limit, is malignant.

There are of course exceptions; and the rule is given only as affording an *a priori* probability;—unreliable unless corroborated by other evidence,—by the causation-history,—by the results of local examination.

Another circumstance useful in the like manner as affecting probabilities; is the absence of any evident causation in the case of non-malignant breast-formations; in cancer, unless the memory has become impaired by lapse of time,—the influence of an exciting cause can almost invariably be ascertained.

The most common breast-affections, with which patients seek advice, (under the dread of cancer); and which are

tissue origin, liable to considerable objection. It is here used to denote the familiar breast-cancer *only*.

primarily non-malignant; may be ranged, in order of frequency, as follows:

1. Fibroma.
2. Pain (*mazodynia*); with or without objective tumour, or thickening of tissue.
3. Cystic disease.
4. Suppuration.
5. Inflamed or irritated lobules; often passing into the preceding.
6. Ulceration about the nipple, often specific. (True Paget's disease is rare.)
7. Collections of inspissated milk.

The rarer tumours (non-malignant) of the mamma; such as lipoma, chondroma, angioma, neuroma, &c.; are to be expected rather in the subcutaneous tissue over or near the breast-proper,—than in the gland-substance. Distension of the organ by milk extravasated into the connective-tissue from rupture of lactiferous ducts in the pregnant state, may originate a seemingly bulky tumour, non-inflammatory, collapsing on puncture,—which is not likely to create any suspicion of cancer.

1. Fibroma.

Very common in young girls at the period of adolescence. Presents no difficulty of diagnosis,—the youthfulness of the patient being almost always a sufficient warranty for the more favourable opinion; as also for the adoption of mild measures of treatment. The typical fibroma varies in size from a hazel-nut to that of a walnut, is moderately hard, freely movable; may form a distinct tumour, easily 'shelling' out upon incision,—sometimes embedded in the mass of the mamma, sometimes more or less detached from this; may be only a local and ill-defined hypertrophy, of the white fibrous tissue basis of the latter. There is no lymph-gland enlargement; the growth rarely tends to increase in size after it is first noticed; the subjective symptoms of pain and tenderness are most marked at the menstrual periods, and vary much with the patient's temperament, habits, and occupations.

The complaint is a trivial one; and probably gives rise to inconvenience, only in so far as the thoughts are directed towards it and in so much as they may be coloured by the universal dread of cancer. It is probable (though not absolutely certain) that in many

instances these neoplasms (even when left alone) disappear in the course of years, particularly if the natural functions of the mamma be brought into play. The writer at least has never seen one (apart from cyst-formation), in any woman of middle or advanced age; which had existed from the period of life alluded to. They usually diminish in size, and may wholly vanish, under the systematic use of absorbent applications, (such as the iodide of lead ointment, with lanoline); excision is not to be recommended, until these last have received a thorough trial.

In early life these little tumours are seldom associated with cyst-formation; and most are small in size;—they are not unfrequently multiple. Those which appear later on (as after the age of thirty) tend to grow to a larger bulk, to develop cysts, and if not interfered with, ultimately to become malignant in some form or other. They are not amenable to therapeutic treatment; and are of much more consequence than the disease above described. It is in fact a clinical mistake to confound together under the same title and description, (*chronic mammary tumour*, *adenoma*, *adenoid tumour*, *sero-cystic disease*, &c.) the common connective-tissue neoplasms, which occur in the female breast at these different periods.

2. Pain without objective tumour. Mazodynia (ὁ μάζος, the breast).

It is a curious circumstance that women (usually of middle-age) very often seek advice in a state of the greatest alarm about painful sensations, purely subjective, in the breast; whereas, when a scirrhous development commences, they generally inform no one of the phenomenon until after the lapse of several weeks or months,—subsequently excusing themselves on the ground that the 'lump' was so painless, they did not think it could be of any consequence.

In the former class of cases, the complaint is often excited by the fact of some friend or relative having recently suffered from cancer, and may be purely mental. Pain more or less 'agonising,' is spoken of, as felt throughout the mammæ, which are very tender to the touch; it varies more with the patient's general health, habits, and state of mind than with the menstrual periods; like other neurotic conditions, is greatly aggravated by excessive indulgence in nervine stimulants, especially tea (which indeed, often appears to originate it). No tumour can be detected.

In many instances, however, (especially when the sensations are more localised) careful examination detects some slight induration, some ill-defined thickening of the gland-tissue underlying these. Local applications may succeed in relieving this, but the sensations

will still persist ; and are to be combated by mental, rather than by merely physical treatment. There is rarely any difficulty in excluding suspicion of cancer ; the patient's temperament, the hyperæsthesia, the severe pain, absence or insignificance of tissue-induration, combine to negative this.[1]

3. Cystic disease.

The most common form is that of a small round or oblong pea-like body, near the root of the nipple ; and evidently consisting of a dilated lactiferous duct. A straw-coloured fluid may generally be squeezed out of the nipple, and sometimes spontaneously exudes. Such may occur at any period of life, and are often attended by considerable pain ; probably from over-distension, as when free exit takes place, there is usually little or no inconvenience.

Single or multiple cysts (apart from any obvious hypertrophy of fibrous tissue), may also occur anywhere in the breast-substance ; the whole of the latter may be found (in early stages) studded with minute vesicles,—in later ones, completely supplanted by a congeries of cysts,—a general cystic degeneration of the mamma.

Small sebaceous cysts may occur in the areola, and under the skin, but are not common ; hydatid cysts are very rare. In pregnancy or lactation, it is not unusual for one or more of the ducts to become obstructed, resulting in the production of a galactocele, or cyst containing milk. A milky fluid is occasionally however exuded, when no pregnancy has taken place. (Some mammary cysts appear to be of lymphatic origin ; but this mode of production is believed to be exceptional.)

These latter are not of serious import ; but as to the former, it may be affirmed that *no such cystic formation in the mamma is devoid of the grave risk of developing malignancy as life advances ; that many are extremely prone to do so.*

[1] The recent death of some friend or relative from malignant disease very often originates all the purely subjective symptoms. In the great majority of cases encountered at a special hospital, under these circumstances ; on giving a history of 'cancer in the family,'—it is found (particularly if several deaths from 'cancer' are reported) that the complaint (whatever shape this may have assumed), proves on examination to be non-malignant. The fact is not without value for diagnostic purposes.

At the same time, provided that the panic fear of cancer in these people be not dispelled, there is reason to believe that the mental condition may in time actually give rise to that disease. Sarah K. (whose case is reported in Appendix C) described herself as having been informed by a medical man twenty years previously, that some slight induration (probably cicatricial) in the breast, would be likely 'to turn into cancer ;' and as having been ever since continuously haunted by the fear of that occurrence. The instance is by no means exceptional.

The usual history of such cases is that after many years of perfect quiescence and absence of any inconvenience from a small localised 'kernel,' the patient (then comparatively advanced in life), either sustains some mechanical injury ; or is subjected to some depressing emotion, as that occasioned by the loss of friends or money. The 'lump' forthwith becomes painful ; quickly undergoes increase in size ; and has to be excised. It is then found that malignancy has supervened in one of three ways.

(*a*) The most common is by the sprouting forth of intra-cystic growths, which consist of embryonic connective tissue (*spindle-celled sarcoma*—the so-called 'Duct-Cancer').

(*b*) By the malignant proliferation commencing in the glandular epithelium of acini embedded in the cyst-wall ; it then assumes the form of *scirrhus*.

(*c*) The cyst, acting somewhat as a foreign body, irritates the acini in its vicinity ; and a scirrhous tumour here begins, primarily external to the former, but subsequently enveloping this. The two latter run the ordinary course of scirrhus ; the former when far advanced, gives rise to the huge fungating masses formerly known as 'fungating adenoid tumours.'[1]

It is obviously of consequence to excise any cyst of the mamma before the supervention of malignancy,—the more so that a very slight operation will usually effect a radical cure. Failing this however, it is necessary to be able to recognise the early indications of cancer commencing in a simple cyst. These are :

(*a*) The supervention of pain in a small tumour, which has previously given rise to no inconvenience.

(*b*) This pain increases in severity ; and concurrently the growth enlarges.

(*c*) There is a history of injury immediately preceding the onset of the former symptoms ; the patient being of mature years. Often also, precedent mental anxieties or trouble.

(*d*) A suspicious indication of less weight than the foregoing is the discharge of blood, or of fluid tinged with blood, from the nipple ; in place of a straw-coloured or milky liquid ; and later on we find retraction of the nipple, adhesion of the skin to the tumour, enlargement of the axillary glands, &c.

From these symptoms, we can discern with certainty the onset of malignancy ; but we are not always entitled to affirm whether

[1] Examples of scirrhus supervening upon a long antecedent cyst are given in Appendix B. From the clinical features of some of these, as well as by an examination of the specimens, it is believed that the association may take place in either of the two modes described above.

this is spindle-sarcoma or scirrhus, until the disease is fairly advanced. The very early appearance of axillary gland-enlargement would point very markedly to scirrhus ; in spindle-sarcoma, it is rare, even at a late period of the disease.[1]

Cysts in the mamma may apparently be developed as *secondary* features ; the primary tumour being scirrhous, which may block up lymph-channels, or lactiferous ducts, causing the retention of effete products. The same phenomenon almost invariably takes place in the course of the connective tissue neoplasms occurring in women of middle or advanced age, (*adeno-fibroma*, *cystic fibroma*) ; and sooner or later becomes associated with malignancy.

Of these, as of cysts, it may be affirmed that, although primarily benign ; and often so continuing for a term of years ; none can be regarded as devoid of considerable proclivity ultimately to develop cancerous phenomena.[2]

With the exception of the small fibromata of young girls, the removal of any cystic or connective-tissue formation in the mamma,—although entirely devoid, at the time, of any malignant feature,—is a measure of expediency.

4. Suppuration.
5. Inflamed or irritated lobules ; often passing into abscess.

The 'bad breast' of the nursing female cannot with ordinary care beget much suspicion of cancer. The local heat, redness, œdema, and acute throbbing pain,—all of recent origin ; the subsequent fluctuation at one or more points, followed (after evacuation of the pus) by persistent sinuses ; and the eventual cure by assiduous strapping,—constitute a familiar sequence of events.

Occasionally the patient comes under observation however in a much less acute stage of the inflammation ; when the above-mentioned classical signs thereof are absent ; when no fluctuating boggy areas can be discerned ; and no matter has yet made its appearance

[1] According to Dr. Gross (*Tumours of the Mammary Gland*) it is wanting altogether.

[2] See Appendix C. It is especially in connection with such cases, that a wrong prognosis may be given, if too great reliance be placed upon microscopic indications. The results of the microscopic examination of a thin section of any doubtful tumour are most valuable in proving the *presence* of cancer ; but are unsafe, if solely relied on (without due regard to historical and clinical evidence)—in establishing the fact of its *absence* ;—can be reasonably trusted for positive purposes, but not for the negative. The sources of fallacy then involved are sufficiently numerous.

outwardly. We find several lobes of the gland-tissue thickened, tender, and somewhat hard; insomuch that the breast appears to contain two or more distinct tumours. The axillary glands may be a little enlarged and tender. The condition generally terminates in suppuration; but may eventually yield to treatment, without the formation of an abscess.

Some of these cases present, at first sight, a decidedly malignant appearance; and as scirrhous deposit may commence in the pregnant state, or during lactation, it is necessary to beware of giving any too positive opinion in a doubtful case until lactation has ceased and the mammæ are reduced to their normal functionally-quiescent condition. Grounds for a favourable view will be found in the patient's condition, and the presence of milk in the breasts,—affording a *prima facie* supposition that the complaint is only inflammatory; locally, in the character of the tumours, and the presence of several (it may be of some size) in different parts of the organ. Whereas in scirrhus, the tumour in the breast-substance, always primarily appears as a single mass;—later on, the presence about the breast of several tumours distinctive from each other, is usually a consequence of subcutaneous connective tissue infection; and is associated only with an advanced stage of disease, perfectly unmistakeable.

When an abscess, (generally chronic), appears in the mamma of a female who is not and who never has been pregnant; the diagnosis from scirrhus is not always easy. The tumour is hard, slowly advancing, is attended by occasional throbbing pain, and by some enlargement (with tenderness) of the axillary glands; the growth adheres to the over-lying skin, and if near the root of the nipple, produces retraction of the latter; the patient moreover is usually somewhat debilitated, and not youthful. It may not be possible,—given a very small collection of pus, deeply situated among rigid fibrous tissue,—to detect fluctuation. In such a case, all the usual symptoms of malignancy are present; but, careful examination will probably disclose some element of doubt,—and then, the useful preliminary step of an exploratory incision will make apparent the real nature of the evil.[1]

6. Ulceration about the nipple; including Paget's disease.

Simple ulceration about the nipple may be caused by injury, or by mechanical irritation, (as by the friction of ill-fitting stays). It is

[1] The writer has seen a very small collection of pus within the fibrous tissue at the root of the nipple, (the patient being a non-pregnant middle-aged woman) produce complete retraction of that part, darting pain, glandular enlargement; and a hard non-fluctuating 'lump' of several months' duration. Such a combination of phenomena very closely simulates scirrhus; but must be very rare.

easily cured; the only danger lies in neglect,—all irritation of the nipple, whether by chronic ulceration, or by any bad habit, being very prone to result in scirrhous deposit,—commencing either locally, or deeply in the breast-substance.

Syphilitic ulceration is usually shallow, and serpiginous,—is associated with coppery stains on the skin, and with the other usual evidences of syphilitic infection,—yields readily to anti-specific treatment.

Paget's disease (so-called 'eczema of the nipple') is rare; and is probably often confounded with the preceding. The sebaceous follicles of the areola with the neighbouring tissue, pass into a condition of chronic irritation, exuding a thin ichorous discharge; the whole surface looks raw, and presents the appearance of a shallow ulcer, the base of which is studded with numerous little papillæ, of a bright strawberry-red colour. When the surface is exposed to the air, the discharge readily dries into a scab.

The disease lasts for years; and is extremely rebellious to treatment by local applications, although some cases of cure have been reported. Failing success in the employment of these, the disease almost invariably results in cancer; and it is expedient therefore that, after a fair trial of milder measures, the diseased tract be radically extirpated by caustic potash, or by some similar agent.

7. Collections of inspissated milk.

Occasionally, we find in the breast, arising during lactation, but not disappearing when the infant has been weaned,—small tumours of bony hardness; they remain stationary in size, do not usually cause pain, and are not attended with marked enlargement of the axillary glands. (But some slight increase in the size of the latter may result from pregnancy; especially if any inflammatory attacks have prevailed. And again, these vary in size in different individuals; it is always a useful precaution to compare the glands on each side.) The marked hardness however will excite suspicion; and it is always advisable promptly to remove them by a small incision, of an exploratory nature; when a little mass of the consistence and appearance of chalk is discovered. Such a step allays the mental apprehensions of the patient; and as it is probable that in the end these collections would act as foreign bodies and so prove mischievous, their removal is expedient on the latter grounds.[1]

[1] The breast may also contain one or more bony (not calcareous) tumours apparently due to the ossification of newly formed fibrous tissue. These are non-malignant; and have been described as 'ossifying fibroma;' an example was

VII

THE ordinary history, and the clinical phenomena of Scirrhus (during the early stages of its course)—may be briefly sketched as follows :

A woman, about or above 38 years of age, is subjected to some mental trouble (loss of money, loss of relations, husband or children ill, &c., &c.) ; in a smaller percentage of cases (11·7 per cent. according to Dr. Gross)—this is also about the proportion observed at the Cancer Hospital—she sustains some mechanical injury ; or again she may be worn out by prolonged physical illness, or simply by over-hard work. Within a few weeks after exposure to one of these conditions, she notices a small 'lump' or 'kernel' at some part of the mamma ; at first it may be painless, and may give her no inconvenience whatever ; after some weeks of gradual increase, she notices a very occasional dart of neuralgic pain, quickly over, and recurring only after an interval (of several days or more). If near the root of the nipple (but not otherwise) that structure becomes gradually drawn in ; and, if the tumour be near the skin, the latter eventually adheres, and becomes somewhat puckered.

Enlargement and tenderness (indications of secondary deposit) in the chain of *lymph-glands* under the axillary edge of the pectoralis major muscle ; and subsequently of those higher up in the axilla,—ensue at a very early period ; but are usually noticed first by the surgeon,—and do not cause trouble to the patient until later on. A woman rarely applies for professional advice until such deposit has already commenced ; although, it is not always evident, (especially in stout individuals) to the touch. Roughly speaking, the more chronic hard, and fibrous the primary tumour, the more quickly does it affect these glands ; conversely, the exuberant rapidly-growing, soft, very vascular cancers, (encephaloid), do not produce secondary deposit as a rule, with anything approaching the same rapidity. And again, when the primary deposit is near the outer edge of the mamma (a thin process of which not unfrequently is prolonged into the axilla, overlapping the edge of the pectoralis)—it is commonly seen to cause

lately in the Cancer Hospital under the care of Mr. F. B. Jessett ; the cases are rare.

The museum of that institution also contains a very old specimen (probably belonging to the same class of neoplasms ; but of which the history has unfortunately been lost) ; in which the whole mamma is filled by a solid mass, as hard as ivory, and larger than an ordinary orange.

enlargement of the adjoining lymph-glands somewhat earlier than when the parts nearer the sternum are first attacked.

There may be *pain* before ulceration has commenced ; neuralgic, intermitting and very variable in frequency of attacks. Any marked suffering associated with a non-ulcerated breast-tumour, however, has already been noted as counting strongly in favour of the absence of malignancy. It is only with the supervention of an ulcer that the real suffering of breast-cancer begins.

The hard fibrous chronic scirrhous 'kernel' most typically shews these paroxysmal darts of lancinating pain. The soft, acute, rapidly-growing instances (encephaloid) may be wholly devoid of any such feature, until a very late stage of development.

Scirrhus commencing at the root of the nipple is as a rule a much more chronic affection than the same commencing elsewhere in the mamma. The deposit here long continues small and superficial,—the lactiferous ducts and their enveloping fibrous tissue, forming a much less favourable nidus of growth than does the gland-tissue proper ; and the breast often retains perfect mobility upon the under-lying pectoral muscle, until the ulcerative process is far advanced. Consequently operative procedures generally afford a better result,—and may be undertaken in a much more hopeful spirit,—at a later period of scirrhous deposit in this situation, than is the case when the deeper parts of the organ are primarily attacked.

For the removal of breast-scirrhus, two valid methods are in use ; extirpation by the knife ; and extirpation by caustics, or by cauterising instruments. From time to time however in the last 150 years, a third agent has been advocated as effecting the same object ; has been eagerly and widely tried, with innumerable modifications in the manner of application ; and in the end has reluctantly been discarded as useless.

The *electric current*, while exerting a certain degree of influence over nerve-function,—has none (except indirectly, as by stimulating palsied muscles) upon nutrition ; apart from the caustic products evolved, when a needle at each pole is inserted into the tissues.

The result of such a practice is the formation of an

eschar or slough,—in extent proportionate to the strength of the current; and to the time during which the latter has been maintained. No insulation of the needles (when a current of average strength has been employed) will serve to protect the skin; and no difference is observable between the sloughs formed at the different poles.

No alteration in rapidity of growth is evinced by a cancerous mass thus treated; and the formation of secondary deposits continues as before. The immediate consequences of the proceeding usually are a number of small ulcers, which may refuse to heal, and may aggravate the patient's condition to no small extent.

With a current of very low intensity; or when no electrolytic puncture by the needles is made; considerable relief to any pre-existing pain is felt, and continues for about two days. Otherwise no effect is discernible.[1]

The truth then appears to be that electricity, and electrical appliances, although occasionally of service in alleviating pain,—are utterly devoid of value, when used with the idea of arresting or even of retarding, cancer-growth. That after such very numerous trials, it is idle to anticipate in the future, any better results from an agent which obviously has not the effect attributed to it. And the manifest objection to the employment of such procedures, is that when adopted in cases amenable to operative treatment, they only serve to ensure the waste of valuable time.

Caustics (whether the rough concoction of the herbalist, or the more pretentious and quasi-scientific 'paste') have but a limited *rôle* in the treatment of breast-cancer; mainly because the chief obstacle to eradication of the disease lies in the secondary deposits, which it is impossible thus to reach. Moreover the primary growth is often deeply-seated; the

[1] The chronicity and insidious character of many cancer-cases (especially when of the scirrhous variety); may obviously confer an adventitious repute upon electrolysis, and similar procedures, or supposed remedies.

It has been plausibly suggested that any objective good results following Dr. Apostoli's treatment of uterine maladies, may be really due to the acupuncture. The benefit which (in renal and vesical disorders) not unfrequently follows a simple exploratory incision, is well known.

frightful sores resulting from caustic applications to mammary cancer were in former days sufficiently familiar.

Such agents are plainly adapted only for the extirpation of malignant deposits, when superficial and localised. In scirrhous cases, they may occasionally be resorted to, for the purpose of destroying an early and chronic ulcer or infiltration commencing at the nipple; or to obliterate 'recurrent' nodules in the skin. With these exceptions, their employment for cancer of the breast will usually involve consequences, more or less disastrous.

Excision by the galvanic écraseur; or by Paquelin's thermo-cautery, is the preferable method of destroying (as a palliative measure) fungous malignant protuberances. The result in these commonly is that, instead of a loathsome excrescence, an excavated ulcer follows; much to the patient's relief and benefit.

It is of great service when the object is to avoid shock; when the patient is unable to endure even a small degree of hæmorrhage; and when there is no possibility of securing union by first intention.

The only operation for primary breast-cancer in which the adoption of this plan can be recommended is for the 'fungating adenoid tumour' (see pages 38, 84).

For primary scirrhus, it is rarely available; and then, for palliative purposes only.

It is manifestly unsafe to attempt the removal of lymph-gland deposits by the thermo-cautery.

Excision by the knife is the only method by which the removal of deeply-seated tumours (such as the majority of mammary malignant neoplasms) can be effected; and by which the secondary deposits, the chief impediments to complete eradication, can be attacked. In addition to the advantages of probable union of the wound by first intention; and of a small subsequent scar,—it is only thus that any methodical examination of the diseased tissues can be made.

An operation however is notoriously followed in a large number of instances, by re-appearance of the cancerous growth. It is proposed now to investigate the ordinary causes of such want of success; and to inquire how far they are remediable.

The pathological formation of scirrhus; its clinical course; and the results of surgical treatment combine to shew that an operation for the removal of such a growth may be justly regarded as analogous to the extraction of a tooth; that provided the whole of the diseased tissue is excised or destroyed, future immunity may reasonably be anticipated.

It is well known however that a number of circumstances interfere to prevent the attainment of that object; and to preclude the removal of the cancer in a complete and satisfactory manner similar to that which characterises the little operation above suggested as an example.

Failing however such complete success,—the impediments thereto lying very commonly in causes bearing no relation to surgical skill,—there appears reason to believe that considerable prolongation of life, and amelioration of suffering may be not seldom attained,—by careful attention to details. That should the disease 'recur' after operation, it may often even then be successfully dealt with; and ultimately eradicated. That should the secondary deposits prove in the end, beyond the reach of mechanical methods, the most distressing features of death from cancer in this situation may be entirely precluded.

For in spite of the low estimation in which,—regarded merely as a question of dexterity in surgical manipulation,—the operation is ordinarily held; and the curt description accorded to it in text-books; a considerable latitude of difference is observable in the manner of carrying out the few simple directions contained in the latter,—which individual operators evince; and correspondingly in their results. Yet in dealing with malignant disease, upon close and anxious forethought, upon careful attention to, and execution of, minutiæ; and upon the practice of varying slight details of procedure in adaptation to each particular case;—do ultimate success, or even temporary benefit, appear largely to depend.[1]

[1] The exception here taken to the directions for excision of the breast in surgical works is (*a*) that they commonly confound cancerous and simple tumours;

Every individual of a species histologically differs from every other; no two being even approximatively identical in microscopic, or even macroscopic structure. In the scientific practice of medicine, every person's habits and temperament have to be studied and weighed,—in estimating the effect of any remedy to be employed. Even fractional quantities of many familiar drugs,—above or below the average dose,—as administered to different patients; are seen to have widely diverse effects for good or for harm. In like manner, every example of malignant disease is apt to differ in some slight particular, from the average of cases met with; and the surgical manipulations involved in its treatment, to require proportionate adjustment.

Of amputations, and of like surgical procedures, a book-description can convey with all needful accuracy the essential steps to be taken in order to ensure—not only a rapid immediate recovery,—but also the greatest amount of permanent benefit. In respect of remedial measures for malignant diseases,—especially when the mamma is the locality in question,—it is a matter of considerable difficulty to indicate even approximatively in any individual instance, the exact details requisite to attain the same end. For example, given two scirrhous tumours, at an identical stage of development, with local and general conditions as similar as can be found; excision of the breast in one, may be so performed that continuance of cancer-growth will become subsequently obvious within a few weeks;—in the other, that no local re-appearance will ever ensue;—the ordinary rules for this operation having been in each instance scrupulously complied with. An attempt is however here made to formulate what seem to be the most essential maxims.]

(*b*) that they indicate the steps to be taken for excision of the *organ*, but not for extirpation of the *disease*,—the two being by no means necessarily coincident.

VIII

1. *The tumour actually discernible by sight and touch is really but a portion of the cancerous growth.*

There is therefore in every case of scirrhus, a more or less wide margin of surrounding tissue, perfectly healthy in appearance, and yet more or less full of cancer-cells, or cell-particles,—which, if not removed, subsequently manifest their presence by 'recurrence.'

Clinical experience teaches that whenever there are good grounds for supposing that many of these have escaped; as for instance when a rapidly growing mass of some duration has been excised (by limited incisions; or for palliative purposes);—the manifestations of continued cancer-proliferation appear within a few weeks, and usually then advance rapidly. If only a few, a fairly long period of local immunity will be gained; and the subsequent developments of cancer-growth will (probably) be chronic and atrophic.

If (as may fairly be hoped when the case is operated on under conditions very greatly the reverse of those last mentioned), all are completely extirpated; the phenomenon of (local) 'recurrence' will not be witnessed at all.[1]

From these considerations the general maxim is deduced: *That in every primary operation for the eradication of a scirrhous growth, a wide surrounding area of seemingly normal tissue should be excised, or otherwise destroyed; the amount of which will mainly be regulated by the bulk, duration, and rate of growth of the mass.*

2. *Only in rare instances are the axillary lymph-glands free from secondary deposit, by the time the patient deems it necessary to seek professional advice.* In scirrhus therefore, secondary implication of these structures before there is any question of operation at all, is the rule; the contrary, very much the exception.

Palpable symptoms of this occurrence are not always easily discernible; it is more or less masked under two conditions: (*a*) when

[1] With the fullest admission of the extreme difficulties so often in the way of a favourable result; it is suggested that whenever a scirrhous growth in the mamma is operated on in a recent stage, 'recurrence in the cicatrix' should be looked on more or less in the light of an opprobrium to the operator.

the patient is stout; (*b*) when degenerative softening occurs very early. But even under ordinary circumstances, tenderness and enlargement of the glands *can* be manifested only when the cancer-nuclei have considerably increased and multiplied within them,—a process which must occupy some weeks at least after the first infection has taken place.

It is therefore mere waste of time (whenever there is no obvious enlargement of these glands) to delay long over a minute examination of them. *In every case, we are justified in assuming that secondary deposit is present; whether we can readily detect it or not.* The almost invariable re-appearance of the cancer in these structures, when they have been suffered to remain after extirpation of the breast,—even when there is no 'recurrence' in or about the cicatrix,—proves the necessity for such an inference; and for its vital importance as a rule of practice.

Moreover, every malignant tumour (whether scirrhous, or of the other major varieties), tends accurately to follow certain well-defined paths; which can usually be predicted. That is to say, the secondary lymph-gland deposits take place in a regular order; the nearest chains being first to receive cancer-germs, which subsequently infect those more distant, and so on. As a general maxim therefore in so formidable a malady as cancer, and one which stretches out its claws so widely to grasp distant structures and organs,—the old name is not devoid of a certain clinical accuracy, and fidelity to truth,—*it is expedient to intercept the cancer-germs on the path by which we know they will travel.*

Hence follows the rule: *That no primary operation for the eradication of a scirrhous growth can be considered complete, unless the axillary lymph-glands on the same side as the tumour, are carefully extirpated (so far as possible), at the same time.*[1]

3. Next to the axillary lymph-glands, the structures which in scirrhus act as the most important vehicles (or rather vehicle, for these are practically one) of secondary infection; are *the subcutaneous tissues and the skin.*

The nearer a scirrhous growth is to the surface, the greater (roughly speaking) is its subsequent tendency to local re-appearance;

[1] Additional reasons for this measure, as a routine practice, are pointed out at page 61.

and the more weighty the difficulties in preventing 'recurrence in or about the cicatrix.' Whenever the skin is extensively, (or even moderately), implicated, there is little prospect of cure; or even of any fairly prolonged local immunity, unless extraordinary measures are taken. The abundant lymphatics and lymph-channels of the subcutaneous tissue seem to form a peculiarly favourable medium for wide diffusion of germs.[1]

Complete adhesion of the skin over the whole of the mamma precludes operation, except as a temporary measure of palliation.

Whenever therefore a scirrhous growth approaches or is adherent to, the skin, it is far more important to eradicate the invisible germs in the subcutaneous tissue than to aim at rapid healing of the operation wound. The object of securing union by first intention is obviously as nothing compared with the prevention of 'recurrence;' and the mediæval plan of searing off the mamma with a red-hot knife, was by no means devoid of advantage,—was probably often much better for the patient's subsequent prospects than the scientific appliances and methods of modern surgery.

Rule 3. *Whenever a scirrhous tumour approaches or is adherent to the skin; the requisite incisions should be made at a considerable distance from the adherent point; and under such circumstances, much more of the skin and subcutaneous tissue should be excised than would otherwise be needful.*

4. Cancer-cells appear to multiply most rapidly in organs or tissues richly cellular and abundantly supplied with blood-vessels; for example, the liver and the marrow of bones.[2]

[1] It is by this channel that the opposite mamma often receives secondary deposits,—and in one instance, the writer witnessed such infection by a chain of subcutaneous nodules, stretching across the back. Frequently, however, the transmission is effected by deep deposits within the thoracic parietes, or mediastina; none being externally discernible.

[2] Although absolute proof is not unattended with difficulty, there can be no reasonable doubt that the 'rheumatic' pains, the cachectic aspect, and weakness out of proportion to any palpable cause noticeable in many cases of breast-scirrhus, are due to exuberant cell-growth in the marrow. The writer has microscopically examined the bones in several of these cases; and found the interior filled by what appeared to be scirrhous cells in great abundance,—together with absorption-lacunæ, osteoclasts, and other indications of progressive disappearance of the osseous substance. After death, the humerus on the side of the disease, and the adjoining ribs, often shew very little calcareous basis remaining; and can be easily divided

The parenchyma of the mamma, although not forming apparently so favourable a soil as these, is yet a suitable medium of cell-growth,—in proportion seemingly to its vascularity and functional activity.[1]

Although therefore, given a very large mammary organ and a very small scirrhous deposit therein, complete extirpation of the gland-substance is not absolutely essential; it is always best to remove a considerable portion of the latter, in addition to the part diseased. And moreover to dissect out the whole is usually advantageous :—(*a*) by enabling the edges of the skin incision to be more readily brought together; (*b*) by the obliteration of a vascular structure, prone to delay healing by subsequent hæmorrhage into the recesses of a more or less deep wound.

Rule 4. *The whole breast-tissue should be removed, by careful dissection; unless the tumour is very minute and recent.*

5. Particularly in a large and adipose mamma, the incisions may be made obliquely; and so, though *apparently* wide of the cancer, may not really sever the infected structures from the healthy, to any great extent. When the lines of incision therefore have been decided upon, it is needful to make sure that the knife passes vertically downwards to the underlying fascia of the pectoralis muscle,—(which fascia appears to act, to some extent, as a barrier to diffusion in that direction). Much more of the probably infected tissues will thus be left behind, than was originally intended at the conception of the operation; though of course the fault may to a certain extent, be remedied, by subsequent dissection,—at the expense of a prolonged anæsthesia.

Rule 5. *Each incision must be carried vertically, and not*

with a knife. At the same time it is exceptional to find these deposits giving rise to tumour-formation; although nodular enlargements, with or without fracture from trivial injury, are found in a small percentage of cases.

[1] Wide differences in these respects obtain between individuals. Usually the younger, and more robust the woman; and the more active her circulation,—the more quickly does a scirrhous tumour locally increase. The influence of pregnancy in aiding the quick growth of a breast-cancer is well known.

Conversely, the older, the patient; the more tenacious her fibrous tissues; and the smaller, the mamma,—the slower is the (local) progress.

Extensive deposits of fat, serve to hide the growth of the tumour; but do not seem otherwise to affect its development. The condition however facilitates removal.

obliquely, into the deeper tissues, until the fascia covering the pectoralis muscle is exposed for its whole length.

6. The early phenomena of Scirrhus are often very similar to those of the harmless Fibroma; therefore, if the age of the patient, and the history of exposure to an exciting cause render any probability of malignancy possible, the safe and trivial procedure of an exploratory incision had better be speedily resorted to,—rather than the patient be allowed to drift into all the dangers of lymph-gland deposit, before any effort is made to effect a cure. When the probabilities lie in favour of suppuration, or of other non-cancerous affection, the subcutaneous injection of cucaine permits this to be done, without the usual previous preparations for an anæsthetic, and the probably unpleasant after-effects of the latter. When, on the other hand, the chances are that we are dealing with cancer, the administration of ether will (supposing the diagnosis prove correct) allow the immediately subsequent performance of the major operation.

Rule 6. *Whenever there is doubt, an exploratory incision must be made at the earliest possible moment.*

7. When scirrhus is located exactly in the centre of the mammary parenchyma, it matters little where the operation for extirpation is begun; though in practice, the operator generally finds it most convenient to make his upper incision first. When however the tumour is situated to one side, it is highly important to make the first cut on the same side and as near the disease as it is intended to remove the potentially implicated tissues. That is to say with a cancer in the upper or lower regions, the upper or lower incision respectively is to be made first; with the same lying towards the sternum, or axilla, the direction of the *first* incision should be so modified as always to pass the nearer of the two to the disease,—the direction of the second being modified correspondingly.

Failing this precaution there is considerable risk that a portion of those tissues which are comparatively nearest to the cancerous growth, (and therefore most dangerous as regards prospects of 'recurrence') will escape removal. When the incisions are commenced elsewhere than is here indicated, the attendant hæmorrhage, &c., render it well nigh impossible to eradicate the most essential structures with that careful calculation which every case of malignant disease demands.

Rule 7. *When an A-central scirrhous tumour of the breast is to be excised; the first incision should be the one which passes nearest to the seat of disease; and should accurately sever all the parts most prone to be infected by contiguity of tissue.*

8. It is not always possible to extirpate all the outlying portions of the mammary parenchyma by the first dissection; nor is it invariably advisable to do so. When the incisions are promptly carried down to the fascia, the whole mass (unless there are adhesions) can be promptly peeled off without further use of the knife, and with little bleeding. It is important however to make sure that no portions of the gland likely to have become affected, shall be left behind; and particular attention should be paid to the occasional prolongation of the mammary substance around the edge of the pectoralis, not uncommonly seen; which is very prone to become the seat of re-appearance, when the axillary regions of the mamma have been found cancerous,—and which requires a little time and trouble for its complete removal.

Rule 8. *After rapid removal of the main bulk of the mamma, careful search should be made for outlying portions of gland-tissue; and these should be dissected out (whenever it is possible they may have become infected).*

9. In the comparatively rare instances in which (with scirrhus) no manifest enlargement of axillary lymph-glands

has yet taken place; it is only possible to attain more or less perfect extirpation of these by scooping out all the contents of the axilla. But when they are obviously attacked, particular attention must be paid to every recess of the axillary cavity; and specially to the chain of glands running up to the clavicle in the fascia on the under surface of the pectoral muscles,—which, if diseased, can be there felt like a row of hard peas; but which are apt to escape notice unless carefully looked for. They convey infection first to the supra-clavicular glands, then to the mediastinal; are therefore dangerous media of future 'recurrence.' The removal of these little organs is not always easy; but can usually be satisfactorily effected by combined internal and external manipulations, with the use of polypus-forceps, &c.,—without resort to division of the muscles.

Rule 9. *Whenever there is obvious secondary disease of the axillary lymph-glands, the under surface of the pectoral muscles must be carefully examined, subsequently to the clearing-out of the axilla; and any pea-like bodies which can be detected in that situation carefully torn away.*[1]

IX

THE details of an ordinary operation for excision of a scirrhous mamma may be briefly sketched as follows: it being assumed that the disease is either *central*, or is nearer the *upper* boundary of the gland.

STAGE I

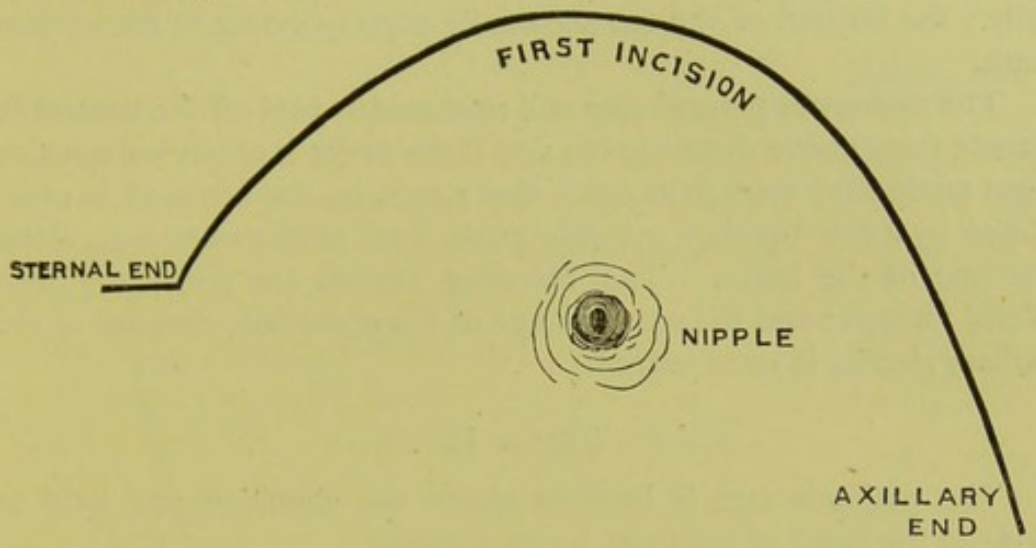
The patient having been anæsthetised, the arm contiguous to the affected breast is brought to her side and kept in that position. This maintains the parts *in situ*; allows the extent of the disease to be accurately gauged; and the lines of incision adjusted accordingly.

An incision is to be made across the upper edge of the breast,

[1] Unless diseased, the presence of these very minute glands cannot usually be discerned by the finger. They are then often found to be rather firmly embedded in tough fascia; the ease with which they can be removed mainly depending on the consistence of the latter.

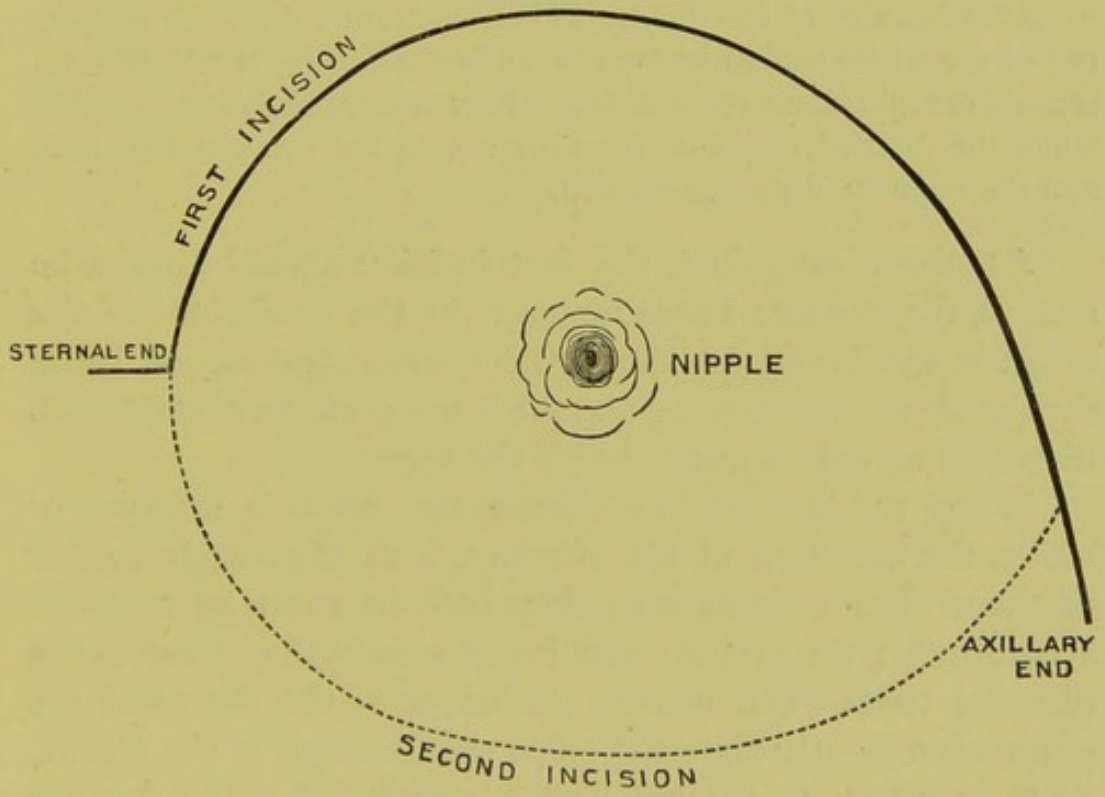
from sternum to axilla, straight for the first quarter of an inch, curved through the rest of its length.

It should pass wide of the tumour; should skirt the probable ex-



tent of the mammary parenchyma, and should be prolonged well into the axilla,—the outer end being considerably lower than the sternal.

A second incision should be a simple curve, around the lower



border of the breast; and joining the first a little way from each end.

The underlying structures, chiefly fat and connective tissue, are now divided along the upper line of incision, until the fascia covering

the pectoralis major is exposed so far as the edge of that muscle; the axillary portion of the incision being deepened at the same time. Care should be taken that the knife severs all the parts vertically; the bottom of the cut accurately corresponding to the surface mark.

The mammary parenchyma will now readily peel off the pectoralis muscle from above downwards; and if the lower incision has not also been made deep enough to reach that structure, the removal is completed by a few touches with the knife, from *within outwards*, along the line of the latter. The bleeding vessels are picked up with Wells' forceps; and the second stage of the operation, removal of the axillary glands, is commenced.

Stage II

The patient's arm is brought above the shoulder, and held as close to the head as possible, by an assistant.

Generally without any further cutting, the contents of the axilla can be well exposed by tearing with the fingers; and the lymph-glands embedded in fat and connective tissue removed by the same means, until the cavity appears thoroughly clear.

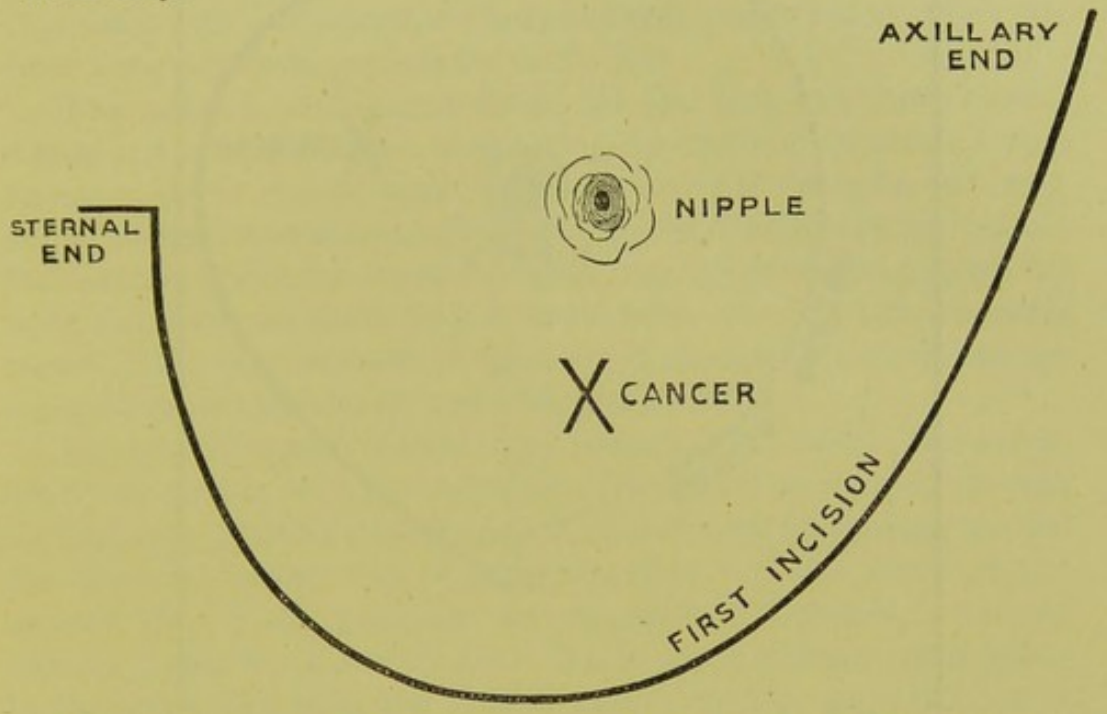
After ligature of the divided bloodvessels, and thorough washing out of the whole wound with water as hot as can be borne, the arm is again brought down to the side and held as close to that as possible; while the divided edges of the skin wound are brought together; and the requisite dressings applied.

As above remarked, the first incision should always be nearest the cancer; hence for such in the *lower* half of the mamma, the lower cut should be the first, the second being then made to correspond: and the lower portions of the breast dissected up before and towards the upper.

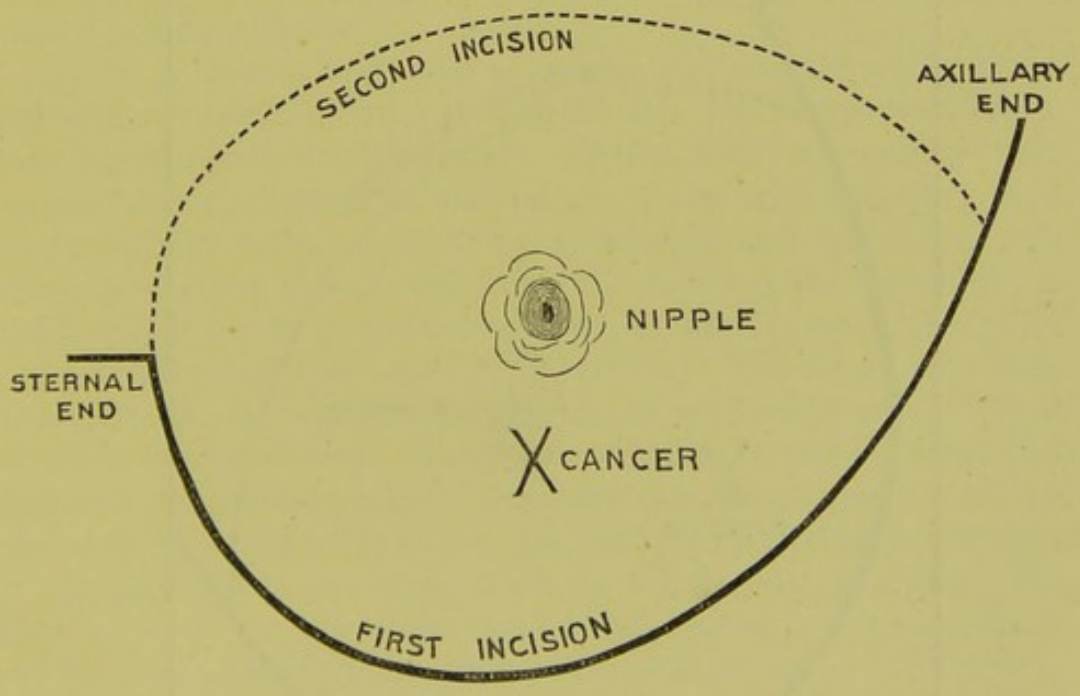
When the disease has commenced towards sternum or axilla, the direction of the incisions, with the long diameter of the oval or circular area they include, must be modified accordingly; the first incision being always the nearer to the diseased tissues, and usually the longer of the two; and the parts subsequently dissected off in the direction of the second. In these diagrams, the left breast is supposed to be the one which necessitates operation.

The slight sternal prolongation of the first incision (for the suggestion of which the writer is indebted to Dr. N. W. Bourns,

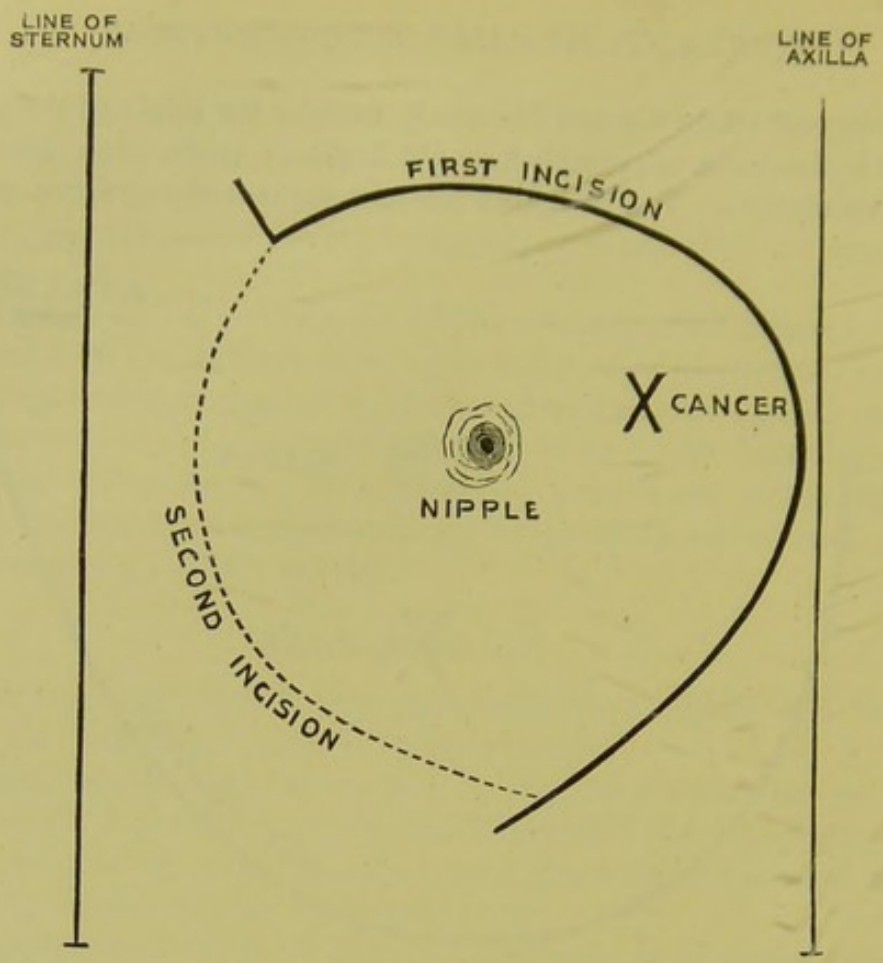
Chloroformist to the Cancer Hospital), enables the edges of the skin wound to be more accurately brought together there, thus leaving a smaller cicatrix. It also makes the subsequent dissection a trifle more easy.



The prolongation of the same into the axilla, allows the performance of the second stage of the operation,—removal of the axillary lymph-



glands,—by means of the incisions made for the breast-amputation. Thus after the first stage has been completed there is no further need of the knife ; only one operation wound results, instead of two ; and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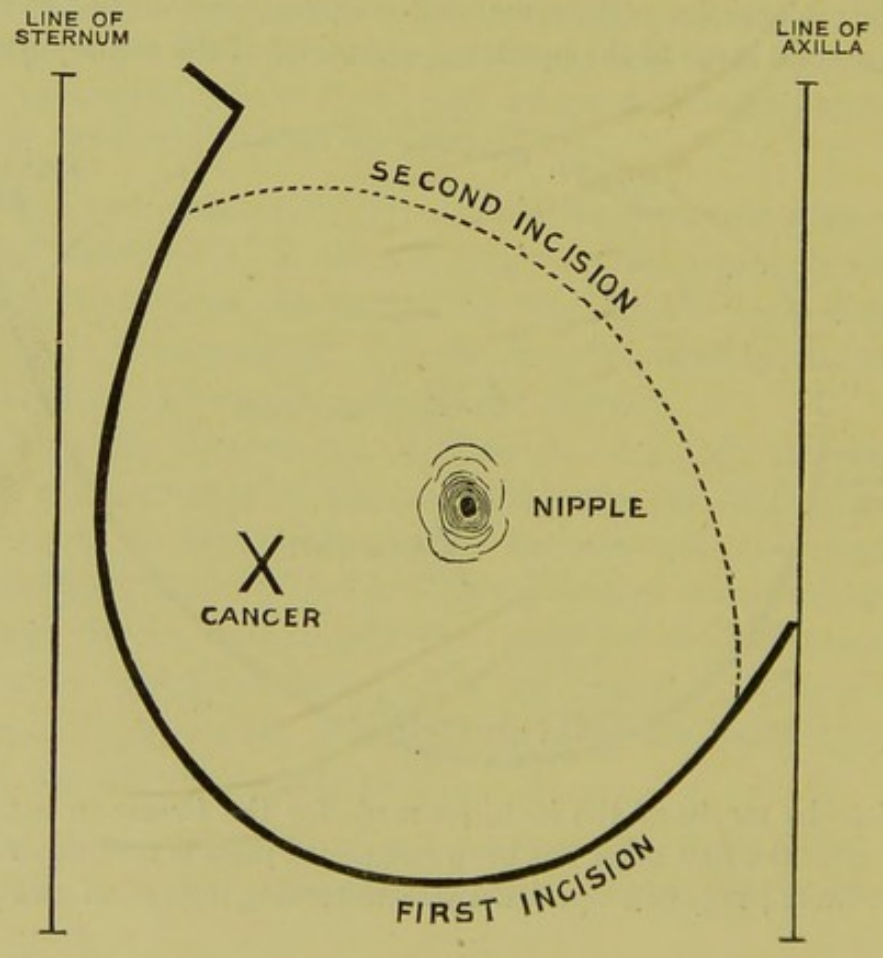
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CANCER
FIRST INCISION

free drainage of the deep cavity left under the pectoral muscles is also permitted.

By cutting well down to the fascia, and then peeling off the gland, a much cleaner wound, (i.e. a much more complete extirpation, and with less attendant hæmorrhage) results ; than when the parts are everywhere severed by the knife.

The position of the arm during the first stage, as above recommended, is of importance ; as enabling the operator to estimate what he has to do, in respect both of the amount of tissue to be removed, and of the subsequent accurate adjustment of the edges of the wound. Its elevation above the shoulder during the second stage, renders the latter far safer and easier than it would otherwise be ; a much better survey of the deep recesses of the axilla is obtained ; the contents are removed more thoroughly, and with greater facility.

It is best during the second stage, not to use the knife. If possible, the lymph-glands, with the enveloping fat, should be scooped out with the fingers ;—possibly at some expenditure of time and pains ; besides the lessened hæmorrhage, a more complete removal can thus be secured than if the parts are cut out,—affected glands in remote corners being more readily felt. But in many patients, particularly in the spare and thin, the fibrous tissues are too tough to allow of this being done ; the scissors will then prove a safer instrument than the knife. And in the debilitated, it is usually best to avoid much laceration of the axillary structures ; which are apt to slough, when general vitality is feeble.

There is usually little risk of any severe bleeding during these procedures,—under ordinary circumstances. But in advanced cases, the lymph-glands in immediate contact with the axillary vein become firmly adherent to that vessel. (The vein ultimately may become wholly occluded ; and, the lymphatics and lymph-channels being blocked up at the same time, the result is the condition of elephantiasis, or 'brawny œdema,' seen in the arm when the axilla has not been interfered with by operation.) The vessel may then be easily torn,—an accident which renders a good light, and a full view of the cavity imperative. Unless the rent can be readily found and ligatured, an aneurism needle threaded with strong catgut must be passed above, and another below, this ; and the vessel tied accordingly.

Catgut is to be preferred to silk for this purpose, as it is quickly absorbed ; silk on the other hand would remain as a foreign body, and be ultimately extruded, only at the cost of prolonged suppuration, sinuses, &c. The two catgut ligatures ensure the formation of a blood-clot at the seat of the tear, efficient enough, (if not displaced by careless handling), to prevent further hæmorrhage ;—then, in the

course of a few hours, swell up by imbibition of moisture, and become loosened. The pressure and inhibition of nutrition are therefore not carried far enough to cause sphacelus.

It is not necessary to excise a portion of the vein or even to divide the vessel between the ligatures,—solely on account of uncontrollable bleeding. If either of these steps be taken, there will be considerable additional risk of *secondary* hæmorrhage, by displacement of one or other of the clots formed at the divided ends; the catgut ligatures becoming speedily displaced, and absorbed. It is obviously a much safer plan (by the application of such ligatures, whose office is merely temporary), to leave the vessel intact; but with its lumen securely plugged by a thrombus, which may be expected subsequently to undergo organisation.

Occasionally however, it will be necessary to excise a portion of the axillary vein, as a deliberate measure of procedure; this being found completely encircled by a ring of cancerous growth. The phenomenon indicates a previously long duration of the disease; and such a measure will not be undertaken unless there seems fair hope that the latter still remains localised; and that the whole may thus be completely eradicated.

It cannot be denied that removal of the axillary lymph-glands adds considerably to the gravity of a simple amputation of the breast. The operation is prolonged; it is not possible to ensure a thorough cleansing of the axillary cavity, without deliberation and careful search. Thus the patient inhales a larger quantity of the anæsthetic; there is somewhat more bleeding, and the resulting wound is necessarily extensive; hence greater shock, some possibility of sloughing among the deep tissues, and greater liability to pneumonia. The subsequent movements of the arm are also interfered with; sometimes materially.

These grave disadvantages, however, may be largely mitigated by careful precautions; and the reasons in favour of the measure are amply sufficient to outweigh them. Thus:

I. It is only in very rare instances, say once in many hundred cases, that the axillary glands are not implicated (by scirrhus) before the patient applies for medical advice. Hence to remove the mamma only is to take away but a part of the already existing cancer-growth,—is *in fact, but a sham extirpation, not a real one.*

II. When the axilla has thus been cleared at the primary operation, —even supposing that the disease ultimately re-appears—the patient yet escapes the most distressing condition of 'elephantiasis' in the arm of the same side, which has been alluded to. A small amount of œdema may take place; but hardly sufficient to cause even inconvenience. What this immunity means in respect of lessened suffering can be realised only by placing in juxtaposition, two cancerous patients in an advanced stage; one of whom has undergone either no operation at all, or one limited to amputation of the mamma; while from the other, the axillary contents have been removed. The huge 'brawny œdema' seen in the former instance is one of the most loathsome and most agonising results of cancer here; the more so, that so little can be done to palliate it, when once established. Its assured prevention therefore is an object worth many risks and much trouble. Indeed when operative measures are resorted to only as palliatives; and there exists no hope of procuring absolute future immunity,—it is a debatable question (supposing that the actual benefits conferred by each of the above two stages in the operation be contrasted) *whether free removal of the axillary contents does not contribute far more to the sufferer's relief than excision of the primary tumour.*

X

AMONG the minor details of the operation for excision of a scirrhous growth (on attention to which depend the prospects of quick recovery, and of small resulting scar),—may be mentioned the following:

When all bleeding points have been securely tied with catgut, the whole wound should be well washed with water as hot as the hands can well bear. This cleanses the wound; checks bleeding; and at the same time promotes asepsis.[1]

[1] If the water is used sufficiently hot, a coagulation of albumen over the whole surface of the wound is immediately witnessed. Experience of the germ-theory seems strongly to indicate that the characters of the soil in which microbes become implanted is a much more important point to be considered for practical purposes than attempts, of more or less questionable efficacy, to terminate the vitality of these or of their spores,—that *inhibition*, not *destruction*, is the object to be chiefly aimed at. Provided that not too many bacteria are deposited on the surface of a wound or other absorbent surface,—and these not of special virulence, as is the case when unclean sponges or instruments are employed; the well-known results of peritoneal surgery may be pointed to as evidence that Nature will ordinarily do all that is requisite, in order to guard against septic infection.

The 'microbe-killers' in ordinary use, as mercuric perchloride, and carbolic

The carbolic spray, (or some equivalent mode of atmospheric disinfection), although non-essential and embarrassing at the first operation, can hardly be dispensed with in subsequent changes of the dressings,—especially in crowded hospital wards, where the air is never too pure.

A strand of horse-hair with the ends tied together by catgut, forms an efficient and unirritating 'drainage-tube.' The real purpose to be served by this appliance appears not to be so much an active one, in the sense of an outward current of fluid discharge expected to result from its employment; it rather serves the purely passive object of maintaining access to the surface, and so of preventing the excreted fluids from becoming pent up ;—an occurrence shewn by sudden and high pyrexia, in the course of a case previously doing well. It is very important at each change of the dressings, to thoroughly evacuate by gentle pressure, the deep recesses of every operation wound. India-rubber drainage-tubes often seem to block up the outward passage of fluids—rather than the reverse; and lie open to other objections.

The horse-hair wisp being thus laid in the wound, with the ends slightly projecting from each extremity of the latter; the severed edges of the skin are brought in contact as accurately as possible,—first by three or four interrupted sutures at regular intervals,—then by a continuous suture from end to end. Strong horse-hair is the best material for the latter; also for the former, if there is no excessive tension. But whenever some difficulty in bringing the edges into apposition is encountered (and such must not unfrequently be the case, whenever the principles here advocated are acted upon)—horse-hair does not possess the requisite strength; and interrupted sutures should be of silk-worm gut or of chromicised catgut. The advantages of this plan are that the interrupted sutures first secure approximation; which is then perfected by the continuous. Also that subsequently the sutures, can be removed in detail, instead of at one dressing; a point not without value in many instances.

It is not advisable, when the incisions are made, to pay too high a regard to the question of subsequently approximating the divided edges of the skin,—to the exclusion of that much more important

acid, are notoriously open to the objection of being tissue-irritants. With the former, although the wound may be perfectly aseptic and free from pus, healing is apt to be slow; and cut surfaces which have been exposed to the action of even very dilute solutions remain 'raw' for a longer period, than is otherwise usual. And if a closed wound or cavity shows symptoms of incipient suppuration, there is no surer method of immediately producing a copious increase in the secretion, than by syringing with a carbolic acid solution, of whatever strength.

object, the prevention of re-appearance. *The prospects of a rapid convalescence may well be sacrificed to those of future immunity.*

Still if primary union can be secured,—in addition to radical obliteration of the disease,—it will naturally be sought. And whenever the cut edges are very wide apart, these may often be successfully approximated by the practice of a little manœuvre described by the writer in the 'British Medical Journal,' May 22, 1886;—whereby advantage is taken of the natural elasticity of the skin.

'I first insert three or four interrupted sutures, making the needle enter and emerge from the skin at a long distance from the wound, (three inches or more), and tie these as tightly as possible; the first twist of the cord being held by an assistant with dissecting forceps until the knot is completed.' Any material strong enough; (silk, silk-worm gut, chromicised catgut) may be used for these first sutures. 'I then introduce a similar row of shorter ones, making the needle enter and emerge at about two inches' distance from the wound; and then a third series, still shorter.' (As some of these are to be permanent, they should be of silk-worm gut, or chromicised catgut.) 'By this time, the edges of the skin-incision are brought so closely together,—in all but very extreme cases,—that a continuous horse-hair suture will serve to unite the whole length of the wound. The first and second rows of long sutures are now removed, having become flaccid and useless; but a few of the third are retained, wherever there is very marked tension, for the first forty-eight hours—not longer. By this means, it is often possible to procure union by first intention in a wound which would otherwise take months to heal by granulation. It need hardly be added that careful support afterwards, by antiseptic strapping, will greatly promote a successful result.'

Whenever extreme tension exists, the most careful antiseptic precautions are useless; local inflammation and suppuration invariably take place. It is very important therefore not to keep in any suture under such circumstances, an hour longer than is absolutely needed; by carefully watching the condition of the adjoining skin, and by cutting the sutures in detail, accordingly as they seem prone to excite inflammation, this tension will be gradually relaxed; and the maximum of good, with the minimum of harm, obtained.

Silk, whether as a material for ligatures or sutures, is unsatisfactory. If used for the former purpose, it invariably gives rise to suppuration and sinuses; acting as a foreign body, and irritating until extruded. For the latter it is more absorbent than horse-hair; seemingly more irritating; and less easy, on account of its colour, of subsequent extraction.

Chromicised catgut is also a dangerous material for ligatures, giving

rise to the same consequences as silk. Ordinary catgut is best; but it is of very great consequence to use this in a perfectly aseptic condition. Its ordinary vehicle, carbolised oil, is a snare; some chemical change appears to take place in the solution whereby the antiseptic properties of the acid are largely, if not wholly neutralised. Hence the ligatures should be steeped, before application, in some more reliable antiseptic. Corrosive sublimate solution (1 in 1000) is efficient; but has the disadvantage of causing the catgut to swell considerably; for the same reason, hot water is inadmissible. Oleum picis answers well; and has not the unpleasant local effects of carbolic acid solutions on the operator's hands.

It is not advisable to restrain hæmorrhage by *torsion*, to the exclusion of ligatures. The result is a very profuse serous exudation, which rapidly soaks through all the dressings; and precludes asepsis.

Corrosive sublimate, although so efficient a microbe-killer, is hardly a satisfactory application to operation-wounds. Even very dilute solutions appear to exert a slightly irritant effect; very obvious in the stronger. Cut surfaces, although perfectly aseptic, long remain raw; and union is never so rapid and favourable as when no such acrid substance has thus been brought in contact with them. Moreover if a large closed cavity be washed out with a poisonous liquid, some amount of absorption is to be expected.

Of materials for the local dressing of operation-wounds, the very cleanly and elegant gauze has some disadvantages,—whatever the germicide with which it is impregnated. The resinous matters commonly used in its preparation are somewhat irritating to the skin; and the mechanical texture of the cloth renders this prone to produce abrasions, where any friction takes place. The costliness of these textures is a great objection to their employment in hospitals; and if corrosive sublimate be the active agent in their composition, the acrid effects of the salt are apt to be manifested by eruptions on the skin, &c.

A cheap, and at the same time very efficient dressing is obtained by rubbing benzoated lard with as much of the tarry liquid sold in the shops under the name of 'Oleum Picis,' (a product of the distillation of wood-tar)—as the former will take up. The resulting ointment is wholly unirritating; and retains its strong antiseptic qualities for any length of time. A large piece of lint thickly spread with it is laid over the wound, over this a sheet of 'marine lint' well pulled out; the whole covered by a layer of 'Gamgee tissue,' and a bandage (of the ordinary 'water-dressing') suitably adjusted. If it be considered desirable to apply more pressure to the axillary cavity, an extra pad of marine lint can be placed under the arm; and perhaps another

below the clavicle, over the pectoral muscles. For the first few days and if there be tension of the wound, for the first week or ten days,—it is advisable to confine the upper arm to the side by a few turns of another bandage,—not by the first, as if this is passed over the arm, it fails to produce that uniform pressure over the deeper tissues which have been severed,—desirable, not only for the prevention of subsequent hæmorrhage, but in order to secure rapid union, without the formation of sinuses. The conformation of the parts here in question obviously does not lend itself to close approximation of the deep raw surfaces. The latter will be aided by pads, and by suitable adjustment of the dressings; especially by turns of the bandage from the opposite axilla, passing first frontwise over the shoulder and back; then over the shoulder, in the reverse direction;—a further fold or two passing like a sling, from the wounded arm-pit around the neck. After this, bandaging the arm to the side, besides securing immobility, will lend some additional pressure.

Unless there is great tension, and consequent imperative need of perfect immobility, it is hardly requisite to restrain the patient's forearm by a bandage; which necessarily entails a cramped and unnatural position. Whereas leaving this at liberty, whenever it can be safely permitted, will be found to add materially to her comfort.

If no tension exists, the horse-hair sutures may be left *in situ*, without harm, for an indefinite period. But the smallest approach to an inflammatory blush in their neighbourhood, necessitates removal of these *seriatim*.

Too rapid removal of the horse-hair strand, ('drainage-tube'), which keeps the ends of the wound patent, is greatly to be deprecated; it is far preferable to leave this a few days later than is necessary,—than, by premature abstraction, to risk the very considerable dangers of pent-up discharges, with probabilities of septicæmia or pyæmia. As a rule, provided all is well, the tube should not be taken out for eight days; with suppuration, or with a very deep wound, not for a much longer time.

If high temperature (104° Fahr. or more) suddenly manifest itself; and be not accounted for by any pneumonic symptoms, it will be necessary to pass a probe, (or better a small director) in various directions, well up into the further recesses of the wound,—until the matter is found; and is permitted freely to exude.

If there is marked *fœtor of the discharges*,—a symptom indicating the presence of some sloughing shreds of tissue,—it will be needful well to wash out twice daily with about ʒij. of linimentum iodi to Oss. of warm water; to search for, and to carefully extract when possible, the dead portions.

At each dressing, the exuded fluids should be gently squeezed out; *but under no circumstances other than the last* is syringing advantageous. Whatever the lotion employed, the use of the syringe in a wound-cavity, invariably produces suppuration; or if that process is already present, largely increases the amount of discharge.

If a sinus form during the union of the divided tissues, i.e. if the superficial parts heal before the deep; it will as a rule heal quickly if the purulent discharge is thoroughly squeezed out twice daily. It is rarely or never necessary to treat operation-sinuses by laying them open.

When union by first intention has not been secured, a saturated solution of Barff's boroglyceride in water forms a very useful local application, antiseptic and unirritating.[1]

When perfect union has taken place it is of some moment as a subsequent precaution to restrain the patient from raising the upper arm, for some months to come; and to impress on her the necessity of not inserting it into the sleeve, but of keeping it close to the side. A very ordinary consequence of premature use is to break down the recent cicatrix, and to cause renewed troublesome ulceration. After two or three months, very gradual use of the limb may be permitted; but until that period has elapsed, the upper arm at least should remain perfectly passive.

XI

WHEN a scirrhous growth has been to all appearance perfectly eradicated, when the parts have firmly united, and the patient is seemingly restored to health,—the real difficulties of the case can be fairly considered only as beginning. A critical time of suspense ensues; a few months will go far to shew whether a merely temporary respite, or perfect immunity has been

[1] The very common routine practice of applying nitrate of silver, or copper-sulphate to granulating surfaces for the two opposite and incompatible purposes of 'stimulating the healing process;' and of 'repressing exuberant granulations,' is one of which the rationale surely needs reconsideration; to children especially, the subjects of extensive burns, it is often a source of great and wholly unnecessary suffering. 'Exuberant granulations' indicate merely a healthy vitality, and require no meddlesome interference; while under the opposite condition of 'indolence,' the first effect of the escharotic is to destroy the bluish margin of newly-organised cells and to enlarge the sore. In practice it will be found that wounds belonging to either class will heal quite as favourably (under mild antiseptic dressings) when these caustic applications have never been resorted to, as when such have been habitually employed.

secured. And should indications of 'recurrence' be found, it is only within this limited period that further steps (frequently of the utmost value) may yet be undertaken, with a fair prospect of averting the usual termination.

In order to attack the remaining foci of proliferating cells (whose perfect obliteration at the primary operation no known precaution can perfectly ensure), with reasonable chances of benefit,—it is obviously important to secure recognition of their presence at the earliest possible moment; while they are yet insignificant in size,—and before they have been allowed time in turn to diffuse infection by lymphatics or blood-vessels. It is only possible to do this by systematic inspection,—by keeping the individual under more or less continued observation.

This is unfortunately a very difficult matter, with the majority of individuals. The re-appearing nodules very often advance quite as insidiously as the primary growth; cause no inconvenience or pain; and are not perceptible to the patient until they have attained considerable size. And it is often all but impossible to secure the attendance under such circumstances of people who are not sensible of an ailment. Besides which the general despondency of cancer-subjects, helps much to promote a hopeless passivity.

All that can be done is to explain to the patient's immediate relatives that the difficulties of the case are practically only at their commencement; that a sedulous and long-continued watch will be requisite before they can even permit themselves to hope that the disease is entirely obliterated; and that it is of the utmost consequence to destroy any points (not of renewed) but of newly-visible cancer-growth,—while yet localised to a minute area or areas.

And not only may one such step be requisite; it may be needful to operate again and again. The introduction of Cucaine into surgical practice has fortunately robbed slight operations of many of their terrors; and will probably serve to render the extirpation of incipient secondary growths a much

more early and frequent proceeding than was the case previously to its discovery.[1]

The following case of secondary infection of the subcutaneous tissue by Scirrhus will shew the advantages of continued observation (after excision of the mamma), maintained over the patient; and of the success obtained by repeated early operations (usually very trivial in character) upon the 'recurrent' nodules.

Breast-Scirrhus. Excision. Seven 'Recurrences,' operated on in incipient stage.

Louisa M., aged 47. Admitted into Cancer Hospital Sept. 1, 1882. Two sisters had died of breast-cancer, one of internal ditto. (Brother died subsequently of 'cancer of the liver' at the London Hospital, in January, 1888.) At the upper part of right breast, a tumour of size of hazel-nut, very hard, freely movable; no enlargement of glands, or retraction of nipple. No history of injury; but some hard work as domestic servant; mental trouble at loss of sister at Guy's Hospital from breast-cancer recurrent after operation, two years since, and constant dread of the same complaint. Worry ten months ago at supposed discovery of fibroid tumour of uterus. The breast excised, and contents of axilla removed. Discharged October 17.

January 28, 1884. Re-admitted. Two small nodules excised, a little above the cicatrix. The latter healthy.

June 13, 1884. Re-admitted. Small nodule removed from above the scar.

November 28, 1884. Re-admitted. Small nodule, of size of large pin's head above the cicatrix in axilla; and similar one above breast-scar, removed.

July 2, 1885. Re-admission. Two nodules removed from subcutaneous tissue adjoining scar.

November 24, 1885. Re-admission. Two minute nodules extirpated, just above the scar of the July operation.

January 21, 1886. Re-admission. Three tiny nodules excised.

March 6, 1886. Re-admission. Small nodule within the cicatricial tissue excised.

[1] The obvious disadvantage however of cancer-operations under cucaine as compared with ether-anæsthesia, is that under the latter a more careful and deliberate examination of the parts can be made, than when the former is used; and that when these are completely relaxed, points of infection which would otherwise escape detection, can often be found.

January 19, 1886. Re-admission. Small suspicious nodular thickening of scar-tissue excised. No malignant deposit however could be detected by the microscope.

The patient, in November 1889, was attending the Throat Hospital for a non-malignant laryngeal affection (palsy of one vocal cord); was otherwise to all appearance in good health.

The question next arises: 'How long is it necessary to keep the patient under observation, subsequently to an excision of the breast for Scirrhus?'

With a view of testing this question, a circular inquiry was issued in 1886, by the writer to all the patients operated on by him in the previous ten years, for breast-scirrhus whose addresses could be ascertained. Replies were obtained in forty-four instances only. The answers (with one exception) shewed that whenever re-appearance of the disease had subsequently ensued, this had become obvious either within two years; or within so short a period afterwards, that a medical inspection would almost assuredly have detected the symptoms within that time.

The exceptional case was that of a woman whose breast had been excised for scirrhus in 1879; who at the date of inquiry had recently (in June 1886) been re-admitted into the Cancer Hospital with evident malignant disease in the liver; having apparently been in good health throughout the interval; and in whom the cicatrix and adjoining axilla remained free from deposit. The patient shortly afterwards went home; and was unfortunately lost sight of.

This affords the only instance of scirrhous re-appearance after seeming exemption for more than two years, which was then ascertained; and constitutes the only one ever encountered by the writer. As evidence of the possibility that immunity for a term of several years may apparently exist, it is far from satisfactory; inasmuch as the patient had been entirely lost sight of between 1879 and 1886; and as no post-mortem examination eventually took place. The period moreover does not greatly exceed that through which 'recurrent' scirrhous deposits in cicatrix or axilla are occasionally

seen to exist; without appreciable deterioration of the general health.

The explanation, would probably lie in some very minute and chronic deposit in the mediastinal lymph-glands; progressing insidiously and ultimately producing hepatic infection. However this may be, it is evident that the phenomenon is very exceptional, and that the following average rule may be formulated for these cases:

If a woman operated on for breast-scirrhus is carefully examined at the expiration of two years; and if then, no local trace of cancer-growth,—no unaccountable impairment of physical strength, and no thickening of adjoining bones,—can be detected; she may with good reason be pronounced permanently cured.[1]

Many instances of scirrhous re-appearance after a long term of years have of course been reported. The occurrence is however so opposed to ordinary experience, that before such can be accepted as valid, it may be well to consider some of the difficulties which beset the investigation of this obscure subject.

The principal fallacy involved probably turns upon a clinical point already indicated,—*the inhibitory influence upon cancer-growth, of abundant and tenacious fibrous tissue.*

If the number of cancer cells or nuclei residual after operation be very large, (as when an obviously advanced case has thus been dealt with, and the evidences of continued growth become manifest within a few weeks); no such effect is visible. The new tissue is quickly eroded by the malignant parenchyma; the presence of the latter and its rapid progres being from the very first indicated by marked vascularity. If on the other hand a case exemplifying opposite conditions is in question; if a very small number of cells or nuclei remain; if there be time for complete cicatrisation to take

[1] Dr. Gross (*Tumours of the Mammary Gland*, p. 168) has made a somewhat similar statement; but he extends the probationary period to three years. He moreover contrasts 'examples of continuous growth;' with those of 'recurrence,' and does not allow for the latent bone deposits evident in many of these cases,—which indicate that the supposed immunity is no more than apparent.

place and for the new tissue to become firmly consolidated before any 'nodules' are discernible; especially if the individual be spare and not of relaxed habit,—it will not seldom be found that the re-appearing cancer-foci will be insidious and slow in their growth and progress. Under favourable conditions as to the patient's habits and surroundings, such may ultimately assume an atrophic form, not incompatible with several (or even with many) years of life.[1]

The residual cells under such circumstances must obviously undergo a relatively enormous multiplication-process before any growth palpable to the senses is produced; they are here embedded in and enveloped by a non-vascular tenacious

[1] The very prolonged career of 'atrophic' cases of scirrhous cancer,—very exceptional as compared with the average duration of life in sufferers from this disease,—is well known; two women were recently under treatment at the Cancer Hospital, in whom the malady was stated to have lasted more than thirty years and twenty years respectively. These were of course, extreme instances.

The inhibitory influence ascribed to tenacious fibrous tissue, both in respect of these, and of 'recurrent' nodules embedded within it, rests upon clinical experience; and is not easy to prove by any report of cases. It can be confirmed only by closely watching and contrasting the progress of minute cancer-deposits in persons of the different habits of body, above alluded to. In the normally 'atrophic' cases, it will be noticed that the patient is thin and spare with very small mammæ; in those subjected to operation, and subsequently shewing in the 'recurrences' marked tendency towards the same phenomenon it will often be noted (in addition to the constitutional absence of fat), that the fibrous tissues are especially strong and difficult to tear. The inhibitory influence of a fibrous capsule upon contained malignant parenchyma of any species,—as evinced by the very rapid cell-growth, which immediately ensues, when the former is broken-through, or otherwise removed,—is generally known and admitted; and tending in the same direction is the slow rate at which cancerous deposits tend to pass the barrier of a resistant fascia,—deposits in the pectoral muscles being usually only a late feature in scirrhus.

The only plausible explanation then of the tardy growth of atrophic scirrhus not interfered with by operation is that we have a much smaller number of epithelioid cells capable of undergoing the malignant proliferation,—than is the case with average females; and at the same time, a relatively inordinate amount of very tough fibrous tissue enveloping these. Hence not only the slow increase, but the many attempts made, as it would seem, by Nature to overcome the disease,—the long stationary periods,—the frequent cicatrisations when the stage of ulceration has been reached, &c. And the same view is here applied to scirrhous 'recurrences.'

The 'favourable conditions' for long life in cancerous patients mean the induction of the most passive and vegetative existence that it is possible to secure,—the aim being to procure and to sustain in such the utmost tranquillity of body and mind.

material, eminently unfavourable to their growth; sensations of pain, uneasiness, or of increased vascularity (which ordinarily herald cancer-re-appearance) are long wanting; and in the midst of a tough fibrous structure, already hard, not seldom somewhat puckered and nodular; they are often far from easy of detection, even by the most practised touch. Little doubt then can be entertained that in many instances, 'recurrent' nodules will not be noticed by the patient until they have long been in existence; until many months or even years, subsequently to the time when they might have been detected by medical examination.

Unless therefore such an investigation has been made, *and the details accurately given*; it is impossible to ascribe validity to any reported instances of 'long recurrence;' of scirrhous, or of other cancerous disease. We have otherwise no even fairly plausible guarantee that macroscopic deposits of cancer were not present, long anterior to their actual discovery. And the ordinary course of malignant growths, should assuredly throw the burden of proving immunity from even gross tumour-formation throughout the supposed interval, upon all who narrate these confessedly exceptional cases.[1]

It is perhaps not entirely impossible that minute deposits within the mediastinal lymph-glands (the next in order after the axillary and supra-clavicular to receive infection in due course of the disease—the same phenomenon takes place later on also by the medium of lymphatic vessels piercing the thoracic wall)—or within the viscera (an exceptional occurrence in scirrhus till the advanced stage),—may have been planted in these parts prior to operation; and may advance there only at an extremely slow rate of progress. Cancer-cells however are known to grow very quickly in highly-vascular parenchyma,

[1] The recognition of these atrophic 'recurrences' in ordinary hospital patients is a very haphazard matter; in spite of the most strict injunctions, it is impossible to get the majority of these to present themselves, until they are conscious of some inconvenience or obvious ailment. Hence statistics of the date of recurrence founded on hospital records are altogether untrustworthy,—so far as they may be advanced to prove the supposed interval of immunity. In almost all merely numerical arguments, the sources of fallacy involved are very numerous; and impossible to eliminate.

such as mainly composes these organs; and to suppose that they may here run an 'atrophic' course is not in accordance with ordinary experience. It may be safely stated that secondary internal deposits of scirrhus never subsist for any length of time without either coincident external growth of the same, on the one hand; or on the other, without betraying their presence by special local or general symptoms,—including that ordinary one of *extreme debility without obvious cause.*

In some instances of 'recurrence' after a prolonged period of supposed immunity,[1] it is not unreasonable to suppose that the phenomena may be accounted for in a different manner; and that we have now to deal with a second attack of cancer entirely independent of the first. There is no possible reason why one attack of malignant disease should preclude a second, at some future date; on the contrary, the individual who has once become the subject of cancer, may plausibly be regarded as having a more than average predisposition towards this. *Given the same causes, general and local, the identical effect must inevitably ensue*; with malignant, as with all other natural phenomena.

The following case is believed to illustrate this point. It is not absolutely convincing, because no record of the patient's condition during the supposed interval of immunity can be obtained, except from her own statements; and no medical examination is recorded to have taken place. From the length of time involved, however; as well as from the manifest mechanical causation of the second attack—there does not appear any valid reason to doubt that the woman was really free from all cancerous disease during the period in question.[2]

[1] As for example after five years of perfect freedom from all subjective or objective symptoms. Viewing the ordinary course of cases not dealt with by operation; and the possible 'atrophic' career of re-appearing nodules,—it would plainly not be permissible to invoke this explanation when any shorter period is in question.

[2] The obscurity of cancer-causation in general, and the small percentage of instances in which scirrhus is brought on by injury, makes *convincing* evidence on such a topic, difficult to obtain.

Sarah C., aged 58, admitted into the Cancer Hospital, March 14, 1886. Eleven years ago, left breast removed at the London Hospital, by Mr. Jonathan Hutchinson, for cancer of nine months' duration. Patient remained well till five months since, then fell, striking side against a table. The present tumour appeared a few weeks afterwards.

On admission the old cicatrix was found perfectly healthy, and freely movable. Between its inner end, and the sternum was a deeply-seated scirrhous growth, as large as a walnut. The right axilla contained a cluster of enlarged glands.

In any medical examination for the detection of re-appearing Scirrhus (such as that here supposed to be made at the end of two years); it is especially needful (after exploring the more obvious and recognised seats of re-appearance) not to omit the adjoining *bones*. Not seldom marked thickening of the upper part of the *sternum*,—next in importance to this, of the *ribs* or *humerus* on the affected side,—is the first symptom (often when all others are wanting); of the continued malignant cell-proliferation.[1]

It would plainly be utterly unwarrantable however, to consider a second attack of cancer consecutive to a primary tumour of the same description, a novel and independent formation:

(*a*) Unless no link of connection between the old and the new growths can be detected by the closest examination.

(*b*) Unless the time of asserted immunity is so prolonged, as to make such a connection extremely improbable, and to exclude possible sources of fallacy. The course of average scirrhous cases indicated a term of not less than five years, when instances of that disease are concerned.

(*c*) Unless a fresh cause, or set of causes, such as would ordinarily serve to originate cancer—have been brought into play, immediately before the second outbreak of disease.

[1] In the *Lancet* of June 12, 1880, the writer pointed out that marked thickening and tenderness on pressure of the humerus on the affected side, in its upper third, is to be found in many of these cases, as an early indication of the continued presence of cancer, after an operation.

(*d*) Unless the pathological characters of the two neoplasms concerned, are identical.[1]

XII

IF the second part of the operation as above described has been omitted, the earliest symptoms of continued Scirrhous growth will almost certainly be found in the axillary lymph-glands; manifest *enlargement* of which, (if not previously present) will be recognisable within a few weeks after the breast-excision. (Before this as already remarked, there is a stage of *tenderness* only; and a prior one, of insidious cell-growth, without any palpable symptoms.) It is highly probable that the local disturbances caused by the excision, —to say nothing, of the generally lowered vitality,—give some additional impetus to any cancer-foci not then eradicated.

It is needful to bear in mind that these glands undergo *very slight* tenderness and increase in size, as the result of profuse suppuration about the breast wound. Also that they vary in dimensions in different individuals; and that some trifling amount of enlargement may have resulted from previous pregnancy, suppuration, &c. The degree in which the two important features here noted, occur in non-malignant cases, is almost always insignificant; and can rarely obscure the diagnosis.

When the axillary contents have been thoroughly cleared away, the first signs of re-appearance will usually be in the neighbourhood of the cicatrix. Supposing that the disease was advanced, or that the incisions were proportionately too sparing of the infected tissues, the whole scar with parts underneath rapidly thickens; presenting a red brawny ill-defined induration, painful and tender. With this will probably be found evidences of cancer-deposit elsewhere, and failure of the general health. The downward progress is

[1] For example, little reliance can be placed upon supposed instances of 'recurrence' (after an exceptionally prolonged term of immunity) in the viscera; when no post-mortem examination has taken place.

steady and often alarmingly acute; a fatal result (generally from intra-thoracic complications) ensuing in a few weeks. In such cases, careful nursing and appropriate palliative treatment will ensure comfort, and will prolong life; but it is rarely that any further operative measures can be advised.

In milder cases of cancer, or after a more thorough removal, the first indications of further troubles in store will be afforded by the appearance of very minute nodules in the subcutaneous connective tissue, closely bordering on the scar; or it may be (less frequently) within the cicatricial tissue itself. When first recognisable, they are round, tender to the touch, and as large as a pin's head. If left alone, they (as a rule) are quickly followed by others; which subsequently infect the nearest lymph-glands—in the axilla, if any yet remain there,—otherwise above the clavicle.

When such tiny nodules are found apart from the scar, and freely movable in the subcutaneous tissue, no doubt can be felt as to their nature; or as to the vital necessity of prompt extirpation. But when they are embedded in the cicatrix, and so cannot be readily moved about by the finger, some doubt may at first be felt whether the local thickening of the tough fibrous band is not an innocent phenomenon, a local accident resulting (it may be) from the insertion of sutures.

Such hesitation however will generally be soon cleared up by observation and by repeated examinations. The malignant cell-colonies tend to assume a *round* form; when this becomes well-marked, and the shape of the thickened spot can be clearly discerned; action should not further be delayed. Or in case of continued uncertainty, it is better to subject the patient to a trivial exploratory incision (after the injection of cucaine); than to incur the hazard of 'recurrence.' As the whole area about the operation-wound long continues somewhat tender to the touch, we cannot regard local hyperæsthesia as any aid in diagnosis. Little or no pain seems to be felt about these nodules until they have attained some size; and as a rule, their presence is first

noticed by the medical attendant, rather than by the patient, i.e. unless very numerous, and with concurrent growth in the deeper tissues.

Among the graver symptoms which indicate the continued presence of cancer-deposits in the system may be enumerated the following:

1. *Enlargement and tenderness of supra-clavicular lymph-glands.* —This unfortunately almost invariably indicates implication of the mediastinal glands, which are beyond the reach of the surgeon; so that, although in an early stage they may be very easily enucleated, little advantage can be expected from that proceeding. Still if the infection is probably recent, it may be attempted; as easy, and involving no risk.

2. *Acute darting pains about the cicatrix*, before the obvious presence of any localised tumour, usually indicate a wide dissemination through the deep underlying tissues; with probable rapid and extensive re-appearance.

3. *Aching pains in the back and limbs*, similar to those of rheumatism, and in like manner relieved by treatment with salicylates;—but in the bones and muscles, rather than the joints; and referred especially to the lumbar region;—denote widely spread secondary deposits in the marrow and cancellous tissue of the osseous system. Sometimes, (but not frequently in scirrhus) local tumours are developed in one or more bones; or without tumour-formation, fractures may occur as the result of some trivial injury. The general absorption of lime-salts (*fragilitas ossium*) incidental to many chronic wasting diseases, also helps towards the last-named accident; but not till after long-continued illness, and the production of extreme emaciation.

4. *A gradually increasing prominence of the upper part of the sternum*, is a local symptom of bone-implication to which considerable importance attaches; as being often the first unfavourable sign, —and sometimes for a long time, the only one, —after an apparently successful operation. A portion of the sternum from about the lower border of the first rib to the third, slowly undergoes a general hypertrophy; as the upper half of the manubrium at first escapes, the bone appears over this area, bent forward and thickened; in one instance only, has the writer found the deposit assume the shape of a roundish prominent bossy tumour, which subsequently ulcerated. The prominence is tender on pressure; but otherwise causes no inconvenience or pain until a late stage. Contrary to the rule with primary

malignant neoplasms of bone, local growth here is usually very chronic; and may not produce trouble for a period of many months, perhaps not for a year or two. The calcareous salts may ultimately (as elsewhere) be completely absorbed.

5. *Pneumonia, pleurisy, obstinate dry cough, jaundice, &c.*, are obviously serious indications of intra-thoracic or of abdominal mischief. The last-mentioned is not usually seen until a very late stage.

The circumstances *favourable to renewed or repeated operation* (after excision of the mamma) are; Very minute nodular deposits, freely movable if apart from the scar; few in number; without glandular infection in axilla or supra-clavicular region; good general health; a cicatrix healthy throughout. With this, absence of pain and of all the graver symptoms above enumerated; as well as an interval of several months after the primary operation, before the little nodules make their appearance. In such a case as this, the disease should be closely followed up with good hope of ultimate success; the patient being kept under continuous observation for two years.

Nodules which re-appear in the cicatrix may be regarded as of somewhat less favourable augury than the former; they are rather less easily extirpated,—and they tend to indicate a more inadequate primary removal of diseased tissues. Provided however that they are few in number, appear strictly localised; that there is no general thickening or excessive vascularity of the scar; and that all the other conditions are favourable, no hesitation can be felt in advising their prompt excision. The unfavourable characters of the scar-tissue as a medium for cancer-growth have been already alluded to. Nodules re-appearing in the cicatrix seldom originate any large tumour, or fungous growth; and the ulcer which usually ensues when they are not interfered with, remains as a rule, shallow and circumscribed.

These deposits unfortunately however serve from the first, as centres for diffusion,—wide in proportion to the length of time they have been allowed to subsist. On this ground, their immediate extirpation is plainly to be sought; although

they themselves often run an 'atrophic' career; and long cause little bodily distress.[1]

In excising re-appearing nodules (however minute), it is obviously important to carry out the same rules as in the primary operation; to remove a fairly wide margin of seemingly healthy tissue around; and to carefully examine adjoining chains of lymph-glands.

Conditions *less hopeful; but still not entirely precluding further operative treatment* are: slight enlargement of the supra-clavicular lymph-glands; general thickening (attended by an inflammatory flush) of the cicatrix; prominence of the sternum at about the second costo-sternal articulation; speedy re-appearance of nodular deposits in the subcutaneous tissue; thickening and tenderness of the humerus on the affected side, in its upper third or thereabouts.

Under these circumstances, although permanent immunity can hardly be hoped for; there is often good reason to believe that excision of the diseased parts will still considerably prolong life, and obviate suffering,—by precluding all the painful and repulsive features which usually attend the external manifestations of cancer.

Among the *conditions which may be regarded as absolutely precluding all further operative treatment* (except when trivial in character, and addressed merely towards the temporary relief of symptoms); the following are the most important:

Very marked failure of the general health;—without discernible cause; and much greater than can be referred to any palpable new growths, should such exist.

Severe 'rheumatic' pains in back and limbs; not yielding speedily to treatment. When these (as is usually the case) indicate cancerous deposits in the marrow, the patient rarely fails also to manifest great physical debility.

Very extensive and rapid local re-appearance.

Marked enlargement of supra-clavicular lymph-glands.

Œdema of fore-arm and hand (indicating cancerous growth about axillary vein).

[1] 'Atrophic' cases of many years' duration are found to present extensive visceral deposits; the fatal ending takes place as a rule much more from the latter, and consequent interference with important vital functions, than from the local disease.

Dyspnœa ; obstinate cough, attended with emaciation, and not clearly referable to any physical cause ; acute pneumonic attacks ; pleuritic effusions, often associated with physical signs of partial lung-consolidation ; patchy areas of dulness on percussion ; &c., &c.

Tenderness and enlargement of liver ; jaundice ; nodular tumours on liver ; with other signs of abdominal mischief.

Infection of the opposite mamma appears to take place sometimes by the agency of the lymphatics in the subcutaneous connective tissue ; in which case a chain of cancerous nodules is usually seen to stretch across from the diseased side. Sometimes by agency of the deeper lymphatics ; when marked prominence of the sternum, thickening and prominence of the adjoining ribs will be also noticeable ; and symptoms of cancerous growth elsewhere will probably co-exist.[1] Or thirdly, by infection propagated from deposits in the mediastina or thoracic parietes ; without any other external evidence of new growth.

A remarkable clinical peculiarity of this secondary breast-affection is that the disease appears as an infiltration, rather than as a distinct tumour ; there is a general induration of the whole parenchyma of ill-defined limits, never by any means so hard as in primary scirrhus ; the breast is heavy,—but the secondary deposit never assumes the shape of the

[1] An out-patient, now attending at the Cancer Hospital, exemplifies some of these conditions. Mary E., aged 60 ; housekeeper ; no family history of cancer : admitted October 22, 1888. One year previously received a blow upon the left breast ; noticed the tumour six weeks afterwards. To the inner side of the left breast was a tumour as large as an orange, freely movable ; over this was a slight lividity and the skin was adherent. Large mammæ ; good general health ; no axillary infection perceptible. The tumour was excised, and the axillary contents removed ; a good recovery ensued.

On January 14, 1889. Very marked thickening and prominence of the sternum, at the junction of this with the second rib ; also of the humerus in its upper third. The cicatrix and axilla healthy.

On June 6, 1889. A tumour (size of small orange) hard, globular, found in the right breast. The sternal prominence much more marked ; cicatrix and left axilla perfectly healthy.

December 1889. Tumour larger ; still movable ; sternal prominence increasing. Complaint of occasional 'rheumatic' pains in loins ; otherwise appearance healthy, —no indications of re-appearance in scar or left axilla. Were it not for the sternal thickening and the pains in question, the case would be a suitable one for operation upon the right breast.

peculiarly hard, circumscribed nodule, so typical of the first attack. And another singular feature is the absence as a rule, of ulceration or of fungous growth ; the deposit runs a passive clinical course, is attended by little pain, and hardly seems to influence the termination of the patient's life, in any appreciable degree.

When the second breast is infected by the first of the channels above mentioned ; it may be advisable in a few rare instances, to extirpate the diseased part, together with the intervening nodules. Such a proceeding can, of course, only be thought of, when the infection is apparently recent, and when there is good reason to believe that no distant germ-colonies co-exist ; if decided on, the contents of the corresponding axilla will also need removal.

As a general rule however, other grave local or general cancer manifestations will be found at the same time ; and the operation is very seldom admissible,—so much the more that the second mammary neoplasm will hardly ever give appreciable trouble, or contribute seemingly to shorten life,—and that therefore little or no palliative benefit can be expected from such a measure.

XIII

THE designation 'Soft, Encephaloid, or Medullary cancer' was applied in former days, before the microscopic distinctive characters of the different varieties of cancer were so well understood, to any malignant growth of soft, brain-like consistence ; it therefore included many cases of lympho-sarcoma, and of round-celled sarcoma, in addition to the acute and rapidly-growing cancerous neoplasms of the mamma. Being therefore of vague import, pathologically, it has now almost fallen into disuse.[1]

In the case of mammary growths however the term 'Encephaloid' may very conveniently be retained in order to designate the more virulent forms of Scirrhus ; in which

[1] The title 'sarcoma,'—as applied to any rapidly advancing soft cancerous parenchyma ; the origin of which is obscure,—would appear largely to have supplanted it.

disease, every gradation may be observed between chronic tumours, whose progress is almost imperceptible, and which permit many years of life,—and acute cancerous masses, fatal within twelve months.

Malignant formations of these two typical extremes own an identical origin (in the epithelioid cells of the acini); the mode of causation appears exactly the same (neurotic or mechanical); and with a slight difference to be presently noted, the clinical course proceeds on the same lines, with variations only of degree; not of kind.

Microscopically, no line of demarcation can be drawn between the two. The only distinction observable between the acute and the chronic forms is that in the former the relative proportion of cell-growth to fibrous tissue is enormously higher than in the latter.[1]

The clinical difference above alluded to,—and which obviously has important practical bearings,—is the relatively slow growth of secondary deposit in the axillary lymph-glands on the corresponding side. So that in these 'encephaloid' cases, with a huge mass in the mamma, ('as big as a child's head')—may be found in the adjoining armpit, two or three lymph-glands no larger than a horse-bean. Whereas with the chronic scirrhous 'kernel,' hard and nodular, it is the rule to find a much greater increase at a very early date; and with a primary tumour insignificant in size;—say, with the latter no larger than a hazel-nut, a mass of infected lymph-glands equal in bulk to a man's fist. In such, the secondary deposits often outstrip the primary, both in rapidity of development; and in progress of the usual degenerative and ulcerative phenomena, which attend advanced cancer.[2]

Although probably somewhat later than in scirrhus, there does not seem adequate reason to assume that deposit does not take place in the axillary lymph-glands (secondary to 'encephaloid' disease) at an early period. If the glands in

[1] With this luxuriant cell-proliferation, necessarily proceeds correspondingly rapid cell-degeneration,—seen under the microscope, as abundant cell-débris,—palpable to the unaided senses, as softened patches.

[2] The very small lymph-gland enlargement present with these bulky tumours, probably often causes the latter to be set down as sarcomata.

question are not excised (supposing that the breast is removed by operation); they usually subsequently speedily indicate infection by noticeable increase,—often then more rapid than before. And in such, any but a very brief period of seeming immunity, is rarely or never encountered. All that clinical observation indicates is that the rate of growth is much less rapid in axillary encephaloid deposits, than in those attendant upon scirrhus,—insomuch that manifest enlargement of lymph-glands is often not present at all until an advanced stage of the primary cancer; and that the fact of infection may thus readily long pass unrecognised.[1]

The same rules of surgical practice which have been advanced for chronic scirrhus will therefore apply to its acute variety; due allowance being made for the insidious and gradual growth of the former, with its very early deposits in the lymph-glands; for the rapid local growth to a huge mass, of encephaloid cancer,—and smaller tendency to obvious deposit in the axilla. Wider incisions with more extensive dissection of the deeper tissues will usually be advisable; subsequently medical inspections at comparatively shorter intervals will be requisite. Provided that the contents of the armpit have already been removed, the condition of the scar

[1] The inhibitory powers of tenacious fibrous tissue have already been pointed out, and plausibly explain the clinical differences observable between Acute and Chronic carcinomata of the mamma.

In the former (Encephaloid), the amount of cell-growth is found microscopically to be altogether out of proportion to the residual fibres of the part. That is to say, either the proliferating cells are so abundant from the outset; or the surrounding fibrous envelopes are so soft, relaxed, and succulent; that exuberant local increase is readily permitted to take place; and little or no pressure is exercised by the latter on the included parenchyma. Hence, (as a rule) comparatively late secondary infection by the lymphatics; hence also, even with a very bulky tumour, little or no pain. The patients are nearly always well nourished; often fat and plethoric; never, of spare habit.

In the typical Scirrhus on the other hand, with the same epithelioid cells of the mammary acini, as the pathological groundwork of the malignant process; we find conditions entirely the opposite;—firm and tough enveloping media,—slow and insidious local development,—early lymph-gland infection, and comparatively rapid increase of the secondary growths,—pain (in the primary tumour) not usually very severe, but much greater than in the preceding. Microscopically, an exaggerated amount of fibrous tissue, as compared with that of included cells; at an operation, the normal fibres of the part found to be far more rigid and resisting than in individuals who have become subjects of the acute variety.

and its immediate neighbourhood will demand close attention, —as re-appearance here is most to be dreaded.

As the cancerous process involved is of an acute form the case will be *ab initio*, much less hopeful and favourable than is typical scirrhus. Beside the exuberant local growth, and greater tendency towards deep infiltration ; towards erosion of any contiguous fibrous septa (such as the fascia overlying the pectoral muscles), with consequent deposits in that fascia, or in the muscle-substance underneath ; we have a heightened disposition towards the occurrence of secondary deposits in widely distant and often anomalous situations ; such as the brain, cranium, or other remote parts of the skeleton.[1]

XIV

OTHER varieties of breast-cancer encountered with more or less infrequency are : Spindle-celled Sarcoma ; Round-celled Sarcoma ; Colloid ; Osteoid.

Of the first-named it may be stated that in the form of intra-cystic vegetations (consisting of embryonic fibrous tissue), the neoplasm is one of the most common malignant formations in the breast ; although being rarely suffered to remain long unchecked by operation, the presence of cancerous characteristics is prone to be lost sight of. In such cases, simple remedial measures of extirpation ordinarily suffice ; and no re-appearance subsequently ensues.

When however its development is allowed to proceed to the stage of ulceration, the result is the 'Fungating Adenoid Tumour' of former writers ; huge vascular masses of granulation-tissue ; which destroy life by repeated hæmorrhages, as well as by the continuous drain of blood-serum.[2]

[1] The Cancer Hospital museum presents an example of such anomalous deposit in one of the optic nerves.

[2] The profuse 'watery' discharge in cauliflower excrescence of the uterus (papilloma) is analogous. Under the term 'Duct-Cancer' have seemingly been described some cases of Scirrhus in association with cysts, as well as of the above. As the malignancy of the latter depends upon proliferation of their connective-tissue elements (the covering of epithelium, usually columnar, not apparently taking part in that process) : it is thought better here to use a less ambiguous designation.

These last-named growths however remain to the end peculiarly localised; and do not implicate (as a rule) the lymph-glands. Their removal may be successfully attempted at a very late stage; and in view of the exhaustion and extreme anæmia usually then present, the galvanic écraseur will usually be found the best instrument for the purpose.

The causes of malignancy in breast-cysts,—with the symptoms by which the supervention of that process may usually be recognised,—have been described at page 38.

The diagnosis of malignancy in the shape of Intra-Cystic vegetations,—from a similar process often also associated with cysts, in the form of Scirrhus,—is of much practical importance. In the former, the lymph-glands are rarely (if ever) infected; in the latter, always; and almost from the beginning.

As a rule however the precise characters of the cancerous deposit cannot be affirmed with certainty prior to excision;—unless the axillary lymph-glands are enlarged—a feature which permits little doubt that scirrhous disease is present. The lancinating intermitting pain of the latter, as contrasted with the continuous ache of cystic distension; cannot be safely relied on.

The precaution of examining the tumour immediately after removal; and before the operation is concluded; will serve to demonstrate the variety of cancer present; leading (should that be scirrhous) to removal of the axillary contents in addition.

On account of this difficulty, and of the impossibility of excluding with certainty all suspicion of scirrhus,—it is advisable to effect early removal of any breast-cyst, which has begun to evince symptoms of malignancy.

In the form of a solid and primarily malignant tumour, spindle-sarcomata however, are not often seen in the mamma.

The analogy of such connective-tissue neoplasms elsewhere would indicate that a blow or muscular strain is usually the exciting cause; although the mechanical injury may have been so slight and trivial, that its occurrence has passed from the memory.[1]

[1] Female patients however remember any blow upon the breast for a long time; and the causation-history, when this organ is attacked by sarcoma, is usually complete.

Mature age of the patient at the time when the tumour first appears ; rapid increase of the latter ; marked hyperæmia ; and pain, more or less continuous,—will ensure a diagnosis of malignancy. If the growth has attained considerable size, without secondary deposit in the axilla, there will be *probability* that the disease is sarcomatous ; as also, if the puckering of the skin and contraction of adjoining tissues associated with chronic scirrhus are obviously wanting ;—the tissues are pushed forwards, rather than drawn in, and adhesion to the skin is only a late feature. It is not safe however to rely upon any of these phenomena ; acute scirrhous (encephaloid) cancers do not produce secondary manifestations, with rapidity in any degree proportionate to the exuberance of the primary neoplasm ; and pain-characters afford obviously a very unreliable basis for special diagnosis. As a rule in these cases, the fact of malignancy is all that can be affirmed with certainty, previously to operation ; its variety being till then an open question.

Directly however the new growth has been excised, a single cut with the knife serves to reveal its true nature. The disease is the malignant correlative of the benign fibroma ; the two neoplasms (innocent and malignant) are at the opposite ends of a scale,—between which are numberless gradations ; some portions may belong wholly to the former type, some wholly to the latter, and with others much difficulty of pathological classification may be encountered ; the well-organised and the embryonic fibrous tissues may be very unequally distributed. Often the periphery of the tumour is firm, white, and fibrous, (which, when the interior is very fluid, appears to constitute a quasi-capsule); its centre soft, pulpy, succulent, and of faint straw colour. The latter is the more embryonic part, and is often indistinguishable from the tissue of a pure myxoma ; the finger can be forced through it with ease. In other instances, the better organised white and fibrous areas on the one hand ; and the yellowish myxomatous parts on the other ; are of more patchy and irregular distribution,—the toughest tissues however being always peripheral.

The fibrous appearance of much of the section ; the straw-

coloured pulpy areas in the central part, or in patches throughout; and the readiness with which the fore-finger can be passed through the latter; are pathognomonic of a Spindle-celled connective tissue formation,—as contrasted, on the one hand, with the hard grey gelatinous homogeneous slightly-concave base, mottled with minute pellets of faintly yellow caseous degeneration, and surrounded by wrinkled and puckered tissue,—which an average section of Scirrhus presents to the eye; or, on the other, with the soft uniformly-greyish friable pulp, and surrounding evidences of high vascularity, evinced by undegenerate Encephaloid (Acute Scirrhus).

In the case here quoted, myeloid corpuscles were mingled with the spindle-cells,—and were associated with a high degree of malignancy. It is noticeable that the case presented features ordinarily indicative of scirrhous growths; such as, retraction of the nipple, glandular enlargement, and precedent mental distress. There was however a history of the strain (rupture of fibres?) which often precedes connective-tissue malignant neoplasms. The peculiar condition of the axillary lymph-glands, and the exceptionally rapid progress of the case, make this otherwise noteworthy.

Spindle-Celled Sarcoma of Breast, with Myeloid Cells. Operation. Speedy Re-appearance in tissue of Pectoralis Major Muscle. Second operation, followed by rapid return and death.

Betsy W. aged 62. Admitted into Cancer Hospital November 22, 1886. Father died of 'cancer of the stomach;' no other history of cancer in the family. Tumour appeared a few days after lifting heavy weight; also much trouble lately passed through. Duration nine weeks since first noticed.

The nipple retracted. Whole of large mamma occupied by a malignant new growth; movable and hard; glands in axilla enlarged and fixed.

The breast excised, and contents of axilla removed. The tumour proved to be a typical spindle-sarcoma, at one part softening; in which the presence of numerous myeloid corpuscles was detected by Dr. A. C. Dove, then a resident medical officer, now pathologist to the Cancer Hospital. The enlarged axillary glands were found converted

into small cysts filled with black grumous fluid: no malignant deposit detected here, however, by microscope. Discharged well (to all appearance) January 11, 1887.

May 2, 1887.—Re-admitted with tumour of three weeks' duration, as large as a small orange, apparently an enlarged lymph-gland, under the pectoralis muscle. In this much shooting pain, worse at night; cicatrix healthy, general health good.

On excision the growth was found to be a deposit in the muscle-substance, at junction of this with the tendon; it was very vascular, soft and breaking-down, and copious hæmorrhage attended the operation. Discharged June 11, 1887; to attend as out-patient.

June 27, 1887.—Wound healed; severe darting pain in cicatrix; extensive deposit again in pectoral muscle; this fixed to chest-wall. A nodule, as large as a walnut, under axillary cicatrix.

After August 8, 1887, the poor woman became too weak to attend as an out-patient, and shortly afterwards died at her own home,—unfortunately with no subsequent autopsy.

According to the degree of organisation, the spindle-sarcoma may be expected to present very varying degrees of malignancy; i.e. of rapidity in development, of tendency to infect adjoining tracts, and so to re-appear after excision. A fairly wide extirpation of the parts immediately bordering on the palpable tumour, may be expected in an average case to prove effectual,—there being little or no tendency towards axillary lymph-gland infection. It will be judicious to apportion the amount of surrounding tissue to be removed, in some measure to the evidences of *vascularity*; if the arteries, which are divided at the operation, are very numerous and large,—the surgeon will probably best attain his object by cutting further, into regions less hyperæmic; and so removing supplementary portions, almost certainly infected by the cancer.

Should 'recurrence' subsequently ensue, it may be looked for by connective tissue channels, rather than by the lymphatic path pursued by carcinoma. In the case above quoted, the muscle substance was secondarily infected; in contrast to the lymph-glands and subcutaneous tissue, which first receive secondary scirrhous deposits.

In addition to the primary growth of a spindle-sarcomatous tumour, there is strong reason to believe that those neoplasms,

composed of new fibrous tissue, which make their appearance in the mamma, during and after middle age; may ultimately develop malignancy of similar type. These are almost always associated with the formation of large or of minute cysts; and are described as 'Cystic Fibroma; Adeno-Fibroma.'

Although such may advance slowly, and attain a large size without causing appreciable inconvenience, except by their bulk; and if excised in that stage may present under the microscope no malignant characters (the solid basis consisting wholly of well-organised fibrous tissue); there is always a possibility of the eventual supervention of cancer in one of two (perhaps of three) modes. Either the spindle-cells tend to revert to an embryonic type, and instead of becoming organised, grow heterogeneously; or intra-cystic vegetations are developed within the cysts. Or occasionally the mass would seem to act as a foreign body; and by irritating the gland-acini in its vicinity to produce a scirrhous infiltration.[1] (For two cases see Appendix C.)

After removal of one of these presumably innocent growths, it is prudent to keep the patient under observation for some time. Whatever the results of microscopic examination, a certain element of doubt as to the presence of cancer, and the possibility of a re-appearance, is never absent; in a woman past the period of youth.

The practical difference between the above and the fibromata of adolescence has been alluded to. Any proclivity towards cyst-formation in connection with the latter (not often seen however in early life), is a suspicious feature; and another which at the extirpation of any breast-tumour of uncertain nature, points strongly towards the presence of malignancy,—is *marked vascularity of the tissues adjoining*.

Colloid cancer, very rare in the breast, may occur as a round or oval tumour; of stony hardness, much more marked

[1] The cribriform appearance of a thin section of these tumours, (to the naked eye) is well known. On microscopic examination, the minute spaces are commonly found filled with cell-masses, apparently proliferating freely; and the larger have evidently contained the same, of which the greater part has been washed away during preparation of the specimen. The growing cells appear to be derived (like those of scirrhus) from the included acinar epithelium.

than even the typical induration of scirrhus.[1] The disease is usually of very slow and imperceptible growth; when first encountered, has often lasted many years without apparent increase; and without causing any inconvenience, except by its weight or bulk. It has little tendency to cause secondary infection; or to re-appear, after removal of the palpable tumour-formation. If however the pathological view which regards colloid as a peculiar degeneration of pre-existing scirrhous or encephaloid parenchyma is correct; it would obviously be imprudent to neglect keeping the patient under observation, for a year or two after such an operation.

Osteoid tumours in the mamma, also very seldom met with, are often non-malignant; and Myxoma belongs to the same class of tumour-formations,—new growths which as a rule, are benign and localised; but which occasionally betray symptoms of malignancy, and re-appear after excision. The cancerous characters then appear to depend upon a certain amount of embryonic fibrous tissue (spindle-sarcoma tissue) included within the myxomatous or bony mass, which constitutes the bulk of the neoplasm. They afford another example of the rule that mammary connective-tissue growths in the later years of life are prone to become cancerous,[2] even when not so originally.

True Round-celled Sarcoma appears to be extremely rare in this locality. It ordinarily commences under the skin, as a soft fluctuating tumour, likely to be diagnosed as a cyst. In the past fourteen years, the writer has encountered but one rather doubtful case, which seemed to merit the designation.[3]

[1] This characteristic feature of a scirrhous tumour is an objective physical sign, resulting from *tension*,—from abundant cell-growth under or within the meshes of rigid and tenacious fibrous tissue. A similar sensation to the touch of intense hardness is produced by malignant parenchyma (which often proves to be soft enough when divided by the knife), in other situations when encapsuled (as by Lympho-sarcoma); being often most marked when little or no fibrous tissue is present within the tumour-substance.

[2] The familiar Lipoma is an apparent exception; but instances of re-appearance with malignant features, after removal, have been reported,—although very uncommon—even of this ordinarily very harmless growth.

[3] Cases of encephaloid (exuberant scirrhus) are apt to be mistaken for this; upon the faith both of clinical phenomena,—a large prominent bulky tumour,

XV

UTERINE cancer is at present seldom recognised until it has reached a stage in which complete extirpation is altogether out of the question. Ample reasons why diagnosis is commonly deferred until a late period are afforded by the insidious manner in which the disease commences ; by the slight difference between early symptoms, and those resulting from natural processes, or from merely functional derangements ; by the natural postponement of a local investigation ; lastly by the favourable nidus for cancer-infiltration and growth which a vascular submucous tissue affords,—by the facilities for dissemination by means of an abundant plexus of lymphatics.

Mental distress is the usual immediate antecedent. The marked subordination of the organ, in respect of its blood-supply and of its normal functions,—to the central nervous system,—in some measure serves to explain this point. And the desquamative changes to which the mucous lining is functionally prone also aid in accounting for the lamentable frequency of the complaint.

There can be little doubt that the covering epithelium of the latter structure, (together with the abundant glands and gland-cells present in the cervical submucous tissue), forms the starting point of the cancerous process in most instances. True connective-tissue cancer-formations (sarcomata) about the uterus appear to be rare.

Whatever part of the uterine or utero-vaginal mucous membrane may first become affected, the disease presents the same features and clinical characteristics as epithelioma elsewhere. When first observed, the most common appearance

with little obvious enlargement of axillary glands,—and of microscopic appearances. An examination under the microscope of several thin sections taken from different parts of the periphery will usually reveal the true nature of the cancer, by the presence there of characteristic scirrhous acini. The soft degenerating central cell-mass is moreover free from any traces of embryonic spindle-cell tissue.

Lympho-sarcoma, commencing in the lymph-glands beneath the axillary edge of the pectoralis major, eventually invades the mammary tissue ; and may also simulate round-celled sarcoma.

is that of the indurated and excavated epitheliomatous ulcer. Less frequently, there is tumour formation in one of two forms : (*a*) the soft, highly vascular, pulpy, Papilloma. (*b*) Fungous bossy growth, firm, solid and roundish in shape. Although the adjoining lymphatic gland chains soon become involved, there is little tendency to distal visceral deposits, although some few secondary nodules in kidneys, liver, or spleen will not unfrequently be found *post mortem.*

Of malignant disease attacking the mucous membrane of the uterine *cavity*, the early phenomena are usually as follows : a woman, who has probably been already debilitated by frequent child-bearing, by privations of various kinds, or similar exhausting conditions, undergoes a prolonged period of trouble ; the health is undermined, there is a general falling off, without any marked localisation,—during which the disease progresses unnoticed. The menstrual periods are profuse and more and more frequent ; in time there may be almost continuous hæmorrhage. Pain, referred chiefly to the supra-pubic region, begins to be felt ; with this, vaginal discharge, often fetid, and increasing anæmia and debility. On vaginal examination, the cervix is found healthy, and although some tenderness and enlargement of the body may be felt, the whole uterus remains movable.

It is obvious that such a chain of symptoms may result from many causes ; and that when the actual area of disease cannot be touched or seen, the difficulties in the way of an accurate opinion will be very great. The occurrence however of *pain and fetid discharge immediately after exposure to special trouble and privation* should always excite suspicion ; and with any probability of malignancy, no time should be lost in securing a thorough examination of the parts, under an anæsthetic ; and after full dilatation, gradual or rapid, of the cervical canal.

When a suspicious or obviously cancerous area is then found ; free local application of the button thermo-cautery, will be the most efficient method of treatment to any small and apparently superficial ulcer. The actual cautery has the advantage of a very superficial action ; and its effects can be

graduated, so as to involve little risk of injury to the deeper tissues, with probably consequent peritonitis. If there is any papillomatous or fungous growth, of limited size and extent ; the best procedure will probably be the extirpation of this by tearing away with the finger, or cutting off with curved scissors,—followed by free use of the actual cautery, thermo- or galvanic.

But unless the disease happens to be very superficial, and very restricted in extent, these measures cannot be relied on ; and the only method which holds out any hope of cure will be extirpation of the whole organ attacked. Involving as it is well known to do very considerable risk, the operation of hysterectomy cannot be undertaken, except as a desperate remedy for an otherwise fatal and painful disease.[1]

It is upon early diagnosis of cancer attacking the uterine body or its cavity, that the future of hysterectomy as a legitimate and warrantable operation, appears to depend ; an object however, (especially in instances like the one first quoted, wherein the cervix remained throughout free from disease, and movable), by no means without difficulty in many instances. Of all cancerous formations, that in question is probably one of the most obscure.[2]

When the uterine *cervix* first becomes the seat of disease, a confident opinion as to the nature of this can usually be pronounced very early in the case,—provided only that the surroundings of the patient inspire suspicion of cancer ; and that a vaginal examination is quickly resorted to. The same conditions precede, as in the foregoing ; there is however much more rapid progress; and pain with fetid discharge appears at a more recent stage. The pain, instead of being supra-pubic and

[1] Several specimens in the museum of the Cancer Hospital, obtained *post mortem*, shew complete localisation to the mucous membrane of the uterine cavity (in one, the cervix with its mucous membrane is entirely unaffected). As in these, the complaint had been necessarily of some duration ; it is permissible to infer that in a recent stage, extirpation of the uterus would have obliterated the whole of the diseased tissues.

[2] In respect of operative procedures on the uterus, itmay be noted that the writer's colleague (Dr. F. A. Purcell) has published five consecutive cases of vaginal hysterectomy, with recovery ;—a success attained by no other surgeon.

central, is referred to the loins and thighs. Hæmorrhages are common, but not invariably abnormal in frequency or in quantity; are most marked when there is papillomatous growth, —in which case profuse serous non-fetid (or only occasionally offensive) discharge rapidly produces extreme anæmia. An examination *per vaginam* will reveal one of the three conditions above mentioned,—generally that of ulceration and excavation. The two others (when tumour-formation is present) are shewn by the microscope to be practically identical with the former; and at a later stage, when the exuberant bosses or vegetations have been removed, either by Nature or by operation, present the same macroscopic features.

The speculum will afford no more information than can be easily gained without its use; and resort to it in such cases is to be deprecated, as very painful, and as likely to cause more or less profuse bleeding. The induration around the malignant ulcer; and the tendency of the granular surface to bleed at the slightest touch; are pathognomonic indications which can be readily estimated by the practised touch combined with the fetid discharge, and complaints of continuous severe back-pain; these leave no room for doubt as to the real nature of the case. Non-malignant ulcers ('granular degeneration') have little tendency to bleed, when touched; are not attended with severe hæmorrhage, or with fœtor; and the pain complained of is comparatively slight and intermitting.

Of tumour formations, the soft and spongy 'Cauliflower Excrescence,' which bleeds profusely at the least touch, and is accompanied by an abundant drain of serous fluid,—though not usually with much or any pain until the exhaustion becomes extreme, and often without offensive discharge,—is readily recognised, on vaginal examination.

A pedunculated Myoma, projecting from the cervical canal, may however be mistaken for one of the round, firm, fairly smooth, bossy cancerous growths not unfrequently met with; which project into the vagina, and often almost completely fill this. The former is not common; there is not much complaint of pain, or of hæmorrhage; if discharge is present,

fœtor is not a marked feature (although partly from retention of secretions, partly from the formation of sloughs, it is occasionally met with); and the general health is ordinarily not impaired, unless other causes of debility co-exist. *Per vaginam*, no thickening and induration about the cervix, and the attachment of the peduncle, will be encountered; and the uterus will be freely movable.

On the other hand a cancerous growth in this situation is always accompanied by abundant purulent or sanious, and very fetid discharge; usually by severe and continuous lumbar and femoral pain, and by very marked impairment of the general health, emaciation, and anæmia. If it has attained any considerable size, the disease will have lasted some months at least, and will have reached an advanced stage; the cachectic aspect of the patient will alone almost suffice for a correct diagnosis. *Per vaginam* will be found induration and thickening of the whole cervix, with fixation; indications that the deeper tissues are infiltrated by the malignant cells. There will nearly always have been an antecedent stage of privation, or of other trouble. It is noticeable that the fungous mass may wholly or largely be removed, towards the end of the case, by gangrene.

XVI

CANCER of the uterine cervix tends to infiltrate very rapidly the sub-mucous tissues;—not only of the cervix itself,—but unfortunately for operative purposes, of the vagina also. A case is seldom met with in which there is not either some degree of fixation; or in which the vaginal portion is not conspicuously eroded.

When once the vaginal wall is implicated; or when the cervix is obliterated nearly to the reflection of the vaginal mucous membrane; operative measures obviously can merely be palliative. The tendency to extend by the vaginal submucous tissue which cervical cancer always exhibits; makes it impossible to hope for any beneficial result from hysterectomy in such cases.

The only chance of cure lies in an attack upon the malady

while yet wholly confined to the tissues of the cervix; and such is impossible unless a very early diagnosis can be effected. With the poor, who lead lives of continuous toil; and who commonly have no time to pay attention to their ailments until absolutely forced; such early recognition can be effected with comparative infrequency,—and little diminution of the large mortality from uterine cancer among the labouring classes can be looked for under existing social conditions. But with women more happily circumstanced, it is not unreasonable to expect in the future, the rescue of many valuable lives.

The following is a case in point. The successful issue was evidently in a high degree due to the early diagnosis.[1]

Malignant Disease in Cervical Canal—Three Caustic Applications—Complete Extirpation of Cervix Uteri—Permanent Cure.

'Mrs. E. J. F. aged 43. Mother of ten children; when first examined had been losing continuously for five weeks, and was gradually bleeding to death. Margin of os uteri healthy; within it a soft round core bleeding freely when touched. Under ether the potassa fusa applied freely; subsequently a marked improvement in general health. The discharge did not however cease; after three weeks a fresh growth was felt, and the application repeated. After another three weeks, "recurrence" was again perceptible; this time chloride of zinc was used. There was great pain and prostration for several days, but recovery ensued. Six months subsequently to the last application the patient had persistent vomiting for two days, owing apparently to menstrual obstruction; but the flow then re-established itself without any surgical treatment, and there has been no further difficulty. The whole of the cervix uteri has been destroyed; at the upper part of the vagina is cicatricial tissue, and above this the body of the uterus can be felt as a small round ball, freely movable on the finger.'

The general anæmic condition, and previous alcoholic proclivities of this lady, precluded any cutting operation.

At the present time (December, 1889) the patient continues to

[1] The case is reported in the *Transactions of the Medical Society*, vol. viii. p. 304.

enjoy the best of health,—the last of the above applications having taken place in July, 1883. It may be remarked that the origin of disease within the cervical canal,—and not, as most commonly the case,—at the margin of the os ; would seem to have afforded less hope of successful treatment, than if the cancer had commenced in the latter more accessible locality.

The point which apparently goes farthest to account for the notoriously incurable and hopeless character of these cases, is the very simple one : *that no suspicion of their real nature is excited in time.*

Accordingly the best hopes for future amelioration lie, without doubt, in the prompt recognition of the *general* conditions prone to engender malignant disease of any part of the body ; but whose operation is nowhere more marked than when this attacks the uterus. Any woman who has recently undergone severe mental trouble ; or who has become conspicuously debilitated by any mental or physical cause, after the first years of adult life are past ; should be regarded as predisposed to malignant disease,—especially of the breast or uterus.

As however in cases of cancer attacking the former of these two sexual organs,—in a certain proportion, there is an account of mechanical injury. Many date from child-birth : the women (usually of the poorer classes) stating that they have been obliged to get about 'very early ; and have never felt well since.'

The tendency of granular degeneration of the cervical mucous membrane ('uterine ulceration '),—to pass eventually into cancer ; may plausibly be inferred from the analogy of sores or excoriations on other mucous membranes, as of the mouth. Whatever the probabilities of mechanical hurt or irritation ; a history of immediately antecedent mental distress is almost always present in addition.

When a localised epitheliomatous ulcer of the cervix has been promptly recognised ; and when the length of the intra-vaginal cervix gives fair hope that the vaginal wall still remains un-infected, free extirpation of the diseased area is manifestly requisite ; and, for securing this object several

methods may be referred to, each of which has certain advantages.

1. Amputation of the intra-vaginal part of the cervix by the galvanic écraseur :

Is generally the most efficient plan, when feasible. The longer this organ, the more satisfactory the procedure ; a very short intra-vaginal cervix, especially if papillomatous and readily breaking down with the least violence, bars it altogether ; and when there is enlargement of the supra-vaginal part also, it will plainly be useless,—at least without additional surgical treatment of the latter. It will be desirable to excise the cervix as high as possible ; and due precaution will be necessary not to include the wall of the bladder in the wire loop. It will also be of consequence to remember that the disease tends to extend most quickly to the submucous tissue ; hence that the membrane lining the cervical canal will probably have become infected much higher up than the muscular substance. In order to prevent 'recurrence,' it will be almost always necessary, freely to cauterise the cervical canal subsequently to the excision,—although the wire may seem to have passed wide of the disease, and through apparently healthy tissue. Paquelin's thermo-cautery should be in readiness for this purpose.

The disadvantages of the galvanic écraseur are difficulty in application to a short or breaking down cervix ; with the production of an eschar very superficial. Its advantages are freedom from hæmorrhage at the time, (so increased cleanliness and facility of application) ; and the important point of leaving the severed blood-vessels and lymphatics sealed up for a few days by a hard eschar,—thus preventing absorption of putrid matters, with corresponding risk of either local cellulitis or of general septicæmia. From the abundant plexuses of absorbent tubes which here prevail, there is always considerable chance of such absorption after any uterine operation in this neighbourhood ; the infection leading either to general peritonitis, or to the milder, though still highly dangerous sub-mucous or sub-peritoneal inflammation. Hence the subsequent need of good nursing ; and of careful syringing as soon as the eschars begin to separate.

2. Excision by the knife or uterine scissors :

Has the considerable advantage that the operator can better adjust his incisions to the extent of the disease ; and after dissecting up the mucous membrane, can remove a considerable portion of the supra-vaginal cervix.

Its defects are that these tissues, always vascular, become more so when cancerous ; that troublesome bleeding, not from large recognisable vessels alone, but in the shape of a general oozing, is apt to obscure the operator's proceedings ; that a raw surface, very prone to the absorption of septic materials, is left behind.

3. Application of the potassa fusa.

This powerful caustic penetrates much more deeply than the actual cautery ; and over zinc-chloride has the conspicuous advantage that its burning action, and with this the necessarily attendant pain, *cease instantaneously upon contact with water.* It is therefore feasible to intermit the applications, so as to permit repeated digital examinations, in order to estimate the extent of the disease, and the amount of suspicious tissue to be removed ; the healthy parts can be efficiently protected ; and there is little or no subsequent suffering. Whereas it is impossible to use the latter salt with the same facility, and so as to allow of the needful examinations from time to time ; and there is afterwards very severe pain for several hours, or even days ; with much constitutional disturbance. Moreover, the chloride does not appear to penetrate so deeply.

The resisting power of the uterine tissue to the action of potassa fusa is very noteworthy ; and provided that the vaginal walls are well guarded, permits protracted applications that would anywhere else be highly dangerous. A number of sticks have generally to be used ; and the sittings occupy from half an hour to an hour. Anything less than this, produces but a very transient effect ; and much perseverance is requisite in order to extirpate (without danger to surrounding parts) every morsel of suspicious tissue.

It is chiefly as an adjunct to the galvanic écraseur that caustic potash will be found most useful. When the intra-vaginal portion of the cervix has been amputated by the former instrument, the cancerous infiltration into the submucous tissue of the cervical canal, which is almost always present, remains untouched ; it is very important to reach, and to destroy this,—and that object is most easily served by the salt in its ordinary stick-form.

When however there is a particularly short intra-vaginal cervix ; or when the cancerous process begins within the cervical canal, the caustic applications may be indicated (as in the case above referred to) without any previous amputation.

The method of application is as follows :

For any cancerous ulcer or growth, it is always advisable that the

patient should be anæsthetised ; without this, the requisite measures cannot be taken with sufficient deliberation ; the sitting, to be effectual, must last some time.

She is then placed in the lithotomy position with a Wells' crutch. Two duck-billed specula are introduced ; and the vagina widely distended by assistants holding these. The next step (if necessary) is to amputate with the galvanic écraseur or thermo-cautery the intra-vaginal cervix ; with it any projecting papilloma or tumour.

The vaginal walls (more especially the posterior) are now protected by several small pieces of wet sponge, held under the end of the lower blade ; and successive sticks of the potassa fusa applied on suitable holders to the diseased tissue. They must subsequently be passed well up the cervical canal, and worked round and round. Occasionally a gloved fore-finger should be introduced in order to gauge progress,—as a preliminary to which, a little water may be injected ; and the wet sponges must be frequently changed.

'So long as any (coarse) disease remains, hard nodular projections will be felt, probably as far up as the internal os ; these may require the scissors, if very tough and fibrous. Only when the interior of the cervical canal can be felt perfectly smooth, lined only with a soft black pasty eschar, may we fairly consider that we have done enough. The sponges and instruments are then removed ; and the vagina well syringed out with cold water.—'*On the Free Use of Caustic Potash in the Treatment of Cancer affecting the Cervix Uteri.*' Proc. Med. Society, vol. viii. 1885.

The sponges soon become saturated with the caustic ; and it is of the highest consequence to change them often throughout the sitting. Provided this precaution is taken ; and a copious douche of cold water subsequently given ; protracted applications and very complete destruction of the parts may be effected with safety,—and without risk of cellulitis or peritonitis.[1]

The potassa fusa may also be advantageously applied in many instances as a merely *palliative* measure. The result of its free use, beside the extirpation of palpable disease, and

[1] The worst feature of the above-mentioned proceeding is the time it involves.

In a woman not past the climacteric, some temporary trouble may be subsequently looked for from occlusion of the canal. As a rule however, with rest and attention to the intestinal evacuations, nature finds a way out of the difficulty.

the temporary relief of symptoms, is the production of a mass of firm cicatricial tissue, very unfavourable to the local development of the cancer-cells ; and so tending to prolong life, in several ways.[1]

Another very useful palliative proceeding is the application of the *crystallised perchloride of iron.* (See 'British Medical Journal,' May 21, 1887, for report of three cases.) This should be resorted to in cases of 'cauliflower excrescence,' soft, and vascular ; whenever the malady is too far advanced, for any hope of perfect eradication. Two or three lumps of the solid salt are passed well up to the diseased cervix ; and the lower part of the vagina plugged by as many pledgets of cotton wool saturated with oil. The patient is kept in bed a couple of days ; the plugs then removed, and the vagina well syringed. The result of two or three of these applications at intervals of a week is that the whole or greater part of the tumour, is shrivelled up and as it were, 'mummified ;' instead of the pulpy bleeding mass, we have henceforward a chronic ulcer, with the usual indurated margins ; there is great relief to symptoms at the time,—a much less rapid subsequent progress with little liability to hæmorrhagic attacks. No anæsthesia is required ; the applications involve no pain, and (with the pledgets used in the mode indicated) no excoriation of healthy parts. (Without this precaution, such an accident is probable.) As these cases tend to early death not only from the frequent losses of blood, but also from consequent profuse and continuous drain of blood-serum ; life may thus be considerably prolonged at no cost of extra-suffering or danger.[2]

The course of uterine cancer is such that whenever reappearance (after attempts at extirpation) ensues, it may

[1] Hæmorrhages of any importance,—which in unchecked cases of uterine cancer, often largely contribute towards the fatal ending,—are rarely encountered subsequently to a procedure of this kind.

[2] Many of these bleeding papillomata occur in young and healthy women. If met with sufficiently early in the case, before the patient has become too much exhausted to undergo operative measures of any gravity,—the perchloride of iron applications may be advantageously employed as a preliminary to more radical methods of treatment.

reasonably be expected within a few weeks or months; continuous after-attendance, with repeated examinations, and prompt action on the appearance of any suspicious nodule, are plainly indicated. There does not appear to be any question, in reference to uterine cancer, of the 'recurrence' after a long term of years which has been claimed for mammary scirrhus.[1]

Briefly to sum up the preceding paragraphs.

Early diagnosis of uterine (cervical) cancer may be best secured by recognition of its tendency to follow conditions of mental and physical depression,—specially the former; and by prompt resort to digital examination in any woman passing towards middle age, or still farther advanced in life, who may have been exposed to such cancer-producing agents, at the first complaint of suspicious uterine symptoms.

When cancer is detected, the most important condition for success in operative treatment is non-infection of the vaginal sub-mucous tissues. When as in the later stages, this occurrence is denoted by fixation of the affected organ; or when, prior to that hopeless period, the intra-vaginal cervix is eroded so closely to the reflection of the vaginal mucous membrane that no doubt of sub-mucous infection remains open,—any local measures undertaken can only be regarded as palliative. Extirpation of the whole uterus does not secure the removal of the diseased tissues,—only of a portion thereof.

When sub-mucous vaginal infection has not taken place, free extirpation of the cancerous area (on the same principles as those advanced in respect of cancerous growths elsewhere), affords a fair prospect of future immunity. The use consecutively of the *galvanic écraseur* and of the *potassa fusa* are believed to offer the best means of attaining that object.

The important special point needful to remember in carrying out this treatment, is the tendency of the malignant infiltration to extend under and along the mucous membrane lining the cervical canal—and hence the necessity of destroying that structure for some distance above the palpable disease,—if possible, as high as the internal os uteri. Subsequently to cicatrisation, continuous medical care for some months is requisite.

Whatever local surgical measures are undertaken, the considerable liability to local or general septic infection (to cellulitis, septic peri-

[1] Cancer-growth however here, as in other localities,—may be much more gradual, in the midst of cicatricial tissue, than under normal conditions.

tonitis, &c.) of the vaginal mucous and sub-mucous tissues have to be borne in mind, and, in addition to precedent and subsequent measures of disinfection, the avoidance of all unnecessary hæmorrhage, and of injury (by tearing or crushing) to healthy parts, will materially aid (more immediately) favourable results.[1]

XVII

RECTAL cancer (Cylindroma) resembles malignant uterine disease in that the early symptoms are commonly confounded with non-malignant functional or organic disorders. It differs however very markedly from the latter, as from ordinary cases of cancer in any other part of the body,—in its peculiar chronicity; often not proving fatal for ten years or even more. As a rule, it appears to escape recognition until it has attained an advanced stage of growth; until infiltration of the adjoining sub-mucous and sub-peritoneal tissues has firmly fixed the intestine.

The prevalence of what is popularly called 'the piles;' by which is meant merely sensations about the anus due sometimes to varicose dilatation of the hæmorrhoidal veins, sometimes to chronically congested mucous membrane,—but often also to mere excoriations and fissures caused by want of cleanliness;—affords the main obstacle to early diagnosis. Many persons suffer all their lives from these ailments without seeking medical advice, and even when a consultation is at last resorted to, a digital examination is naturally postponed as long as possible; the patient's own estimation of the symptoms and their significance being accepted.

As the cancerous process, in all probability, and judging from the analogy of what happens in sites more exposed to observation, begins in some chronic non-cancerous excoriation or ulcer; so the sensations long associated with the latter merge gradually and imperceptibly into those resulting from the former. The general health has usually been previously impaired; and any additional deterioration may hardly be noticed until after the lapse of many months. Hence it is

[1] The liability of patients to Pneumonia after any copious loss of blood has been alluded to at page 18. Of the uterine cases in question, Anæmia is commonly a very marked feature, before operation.

always difficult to ascertain, with any approach to accuracy, when the disease actually commenced.

The usual antecedents are either habitual constipation or 'piles;' it may be inferred from the genesis of cancer in other mucous tracts,—that rectal cylindroma also takes its rise in areas of tissue subjected to long-continued mechanical irritation; and that general conditions of lowered vitality predispose.

In a person obviously broken-down, and elderly; uneasy sensations about the anus, occasional loss of blood, and mucous discharge,—especially if novel and recent,—will probably excite suspicion. But even in the comparatively youthful and robust, in whom rectal discomfort and hæmorrhages are common features, of non-malignant affections,—the presence of continuous discharge should induce an early resort to digital exploration; which will rarely fail to reveal the presence of any cancer-growth or malignant ulceration. The characteristically indurated edges of the latter, together with the attendant pain, serve readily to distinguish the disease in question from a non-malignant sore.

In the comparatively small number of cases in which the cylindroma occurs too high to be reached by the finger, the diagnosis has to be made on general grounds; progressive emaciation and cachectic appearance, marked flatulence and uneasiness in the abdomen, an occasional gush of blood, pain, mucous discharge, continual looseness of the evacuations, local tenderness on pressure. If there is narrowing of the calibre of the bowel, there may be passage of the fæces, in small scybalæ, alternating with a chronic diarrhœa; or occasional attacks of obstinate constipation, diversify the habitual looseness. According to Mr. Jessop (Address in Section of Surgery at Leeds Meeting of British Medical Association, 1889), complete obstruction is almost certain to occur sooner or later.[1]

[1] Sometimes the sudden onset of complete obstruction, (as in a case lately under the writer's care), may be the first indication of very advanced malignant disease of the large intestine,—in the instance referred to, of extensive cancerous ulceration of the sigmoid flexure previously unsuspected, in an old man healthy-

In these obscure cases, digital examination under an anæsthetic,—involving it may be the introduction of the whole hand into the intestine,—may be requisite before a satisfactory conclusion can be arrived at. The use of bougies is a practice fraught with danger.

The efficient treatment of any non-malignant ulcer or similar irritative condition, is an obviously important measure of prophylaxis. A radical cure can be attempted only when the lower portion of the bowel is affected,—which is fortunately the case in most instances; and when the diseased area is freely movable and localised,—every part being within reach of the finger. Infiltration of the deep submucous tissues, as indicated by fixation; on the other hand completely bars such operative procedures. It sometimes occurs with great rapidity, being greatly promoted by intercurrent attacks of cellulitis. The difficulty here, as everywhere else in the body, is to be able to attack the disease early enough; with that proviso, the ordinarily very exceptional protraction of its clinical course over so many years would seem to hold out very good hopes of success, by free excision. But after long duration, even though the local disease still seem limited and circumscribed; it is highly probable that secondary deposit will have taken place,—particularly in the liver. The course of the hæmorrhoidal veins explains the frequency with which masses of cylindroma are found *post mortem* in such cases; and it is always necessary to closely examine the hepatic organ before advising an operation. The condition of adjoining lymph-glands, so far as this can be ascertained, must also not be overlooked.

The steps needful in performing excision have been well described in the writings of Mr. Harrison Cripps (*q. v.*). This procedure is now well established as a substantive and highly useful operation, involving no special risk; and if (as may perhaps be hoped) the average recency of its performance relative to the duration of the cancer-growth tend to improve in future years, will doubtless take much higher rank.

looking and well-nourished. The administration of some opiate in order to check 'diarrhœa' will often precipitate such an occurrence.

Any merely local 'recurrence' can be very well dealt with by a further operation; the abundant cicatricial tissue resulting from the primary tending to localise and to restrict the development of the re-appearing 'nodules.'

The after-effects of the measure however often prove very distressing to the subject; and their obviation or relief greatly tax the skill and resources of the surgeon. Although a limitation of the operation by which a small strip of the mucous membrane is saved, diminishes the subsequent contraction of the cicatrix; it is not always possible to secure this, except at the expense of what should be the foremost consideration, —removal of all possibly infected tissue, and complete eradication of the disease. Confining the patient rigidly to bed until the tedious process of cicatrisation is complete, permits a more gradual and uninterrupted filling up of the cavity with new fibrous tissue, which has proportionately less tendency to contract. Failing that precaution, the judicious use of bougies will be needed; but in extreme cases, health and comfort will be greatly promoted by a subsequent resection of the bowel in the inguinal region.

This measure (as advocated and successfully performed by my colleague, Mr. F. B. Jessett) while *par excellence, the* palliative operation for rectal cancer not admitting of entire extirpation,—may also be confidently advised in cases of radical cure, unhappily marred by subsequent contraction of the anal orifice. In the latter, the source of trouble and suffering is at once annulled; in the former, while the cancerous surface is not interfered with, the pain and irritation caused by the passage of fæcal matter over it are entirely done away with; the subsequent course of the disease considerably retarded; and the patient restored to comparative health and ease. Without apparently adding to the risk incurred, the operation affords considerable advantages over a simple colotomy, lumbar or inguinal; as the latter seldom succeeded in effecting a complete diversion of the evacuations; and the passage of small quantities of fæcal matter by the natural channel was always a source of annoyance and trouble to the end of the case.

Mr. Jessett has kindly favoured the writer with the following description of his method:

'*Preparation before the operation.*—The patient should be fed entirely on liquid diet, strong beef-tea (strained), Brand's or Valentine's essence of meat, milk, &c.; the bowels should be kept well opened by castor oil, and the rectum washed out with warm water for three or four days prior to the operation.

'*Operation.*—An incision about two inches long being made in the usual position, pass the index finger of the left hand into the wound downwards and backwards until it reaches the brim of the pelvis; the finger is then passed along this until it arrives at the sacro-iliac synchondrosis; here the descending colon will be felt dipping into the pelvis; the finger is next passed over the colon and a portion of the sigmoid flexure hooked up into the wound, and about six inches of intestine drawn out through the parietal opening.

'A band of indiarubber is now passed through the mesentery and fastened tolerably firmly round the intestine as high as possible, to prevent the escape of fæces. The wound is next packed with sponges, to each of which a long string is attached, and the loop of intestine outside the abdomen is packed round with cotton wool soaked in carbolic lotion. The intestine is now cut across with scissors about three inches from its upper end, and the contents evacuated; and if necessary the gut should be washed out with warm water. All bleeding points must now be secured, and the divided end of the lower segment invaginated and a few catgut sutures passed through the serous and muscular coats to retain it in position. This portion of the flexure is then allowed to drop back into the abdominal cavity.

'The divided end of the upper portion of intestine is next invaginated and secured by means of catgut sutures passing through the serous and muscular coats; the india-rubber band is now to be removed.

'The parietal wound is next closed by means of silkworm-gut or silk sutures, care being taken to pass the suture just above the intestine through its serous and muscular coats, so as to fix it; and the suture on the lower side should be made to pass through the mesentery.

'Two fine silk sutures should also be passed through the muscular and serous coats of the bowel on each side and the whole abdominal parietes.

'Finally, the spur of intestine about three inches long which is left protruding from the wound, is packed round with thymol gauze, and the whole covered with a thick pad of cotton wool, and a many-tailed flannel bandage lightly applied.

'The dressing should not be disturbed for three, four, or even five days unless symptoms of oppression or strangulation should occur. This has not been the case in any of my cases, nor is it to be anticipated, owing to the bowels having been thoroughly cleared out before the operation, and the patient having been kept exclusively on spoon diet for some days prior to the operation.

'The patient should have nothing by the mouth for the first twelve hours, and then only some Brand's essence, strained beef-tea, milk, &c., until the second part of the operation is performed.

'On the third to the fifth day the spur should be cut away on a level with the abdominal parietes with scissors, any bleeding points secured, and the wound dressed with borax ointment.

'The advantages claimed for this operation are :

'1st. The diseased portion of bowel is completely shut off from the upper ; therefore there can be no leakage of fæcal matter over the ulcerated surface.

'2ndly. The lower portion of bowel being invaginated and returned into the abdominal cavity ; there can be no protrusion of the mucous membrane from it.

'3rdly. The upper portion of intestine being divided so closely to its origin, there is not so much likelihood of procidentia or prolapse of the mucous membrane here.'

XVIII

MUCH previously affirmed of rectal cancer,—the complaint of 'piles,'—the importance of a prompt examination, especially when the patient is aged and the sensations seem to be of novel origin,—and the consequence of securing the prompt healing of excoriations or fissures ; will apply also to *epithelioma of the margin of the anal aperture.*

In addition however it may be pointed out that the abundant adipose tissue of the ischio-rectal fossæ affords especial facilities for wide and deep extirpation of the infected area ; allowing the operator on the one hand to eradicate completely the palpably diseased parts, together with the usual surrounding radius of invisible cells and nuclei ; on the other, to remove with favourable hopes, ulcerated masses of cancerous infiltration, which are of considerable duration and extent.

The galvanic écraseur appears the most suitable instrument for excising any *large* mass of diseased tissue,—causing

no hæmorrhage, little shock, leaving behind an eschar of dead tissue which prevents absorption of septic matters for the first few (critical) days. By its means we may without fear attack extensive disease in old and debilitated subjects, with whom even slight shocks or the loss of a small amount of blood, would be highly dangerous ; and the resulting wounds in such, often heal with great rapidity.

It is of the utmost consequence however to ensure the passage of the heated wire wide of the obvious disease ; to that end the careful insertion of curved needles mounted in handles at various angles to each other, and in such a manner that the wire loop when adjusted under them completely and evenly encircles both the infiltrated parts and a fairly broad and uniform margin, of apparently healthy tissue,—is a necessary preliminary. The curve which the cauterising wire should usually describe in advanced cases,—extending deeply downwards into the tissue of the rectum and the ischio-rectal fossæ,—makes the operation somewhat more difficult and protracted than when the thermo-cautery is used on the flat ; and it is judicious to keep several strands of platinum wire in reserve should any breakage take place. The skin should be divided with the knife before contact is made in such a manner as to form a bed for the wire ; without this precaution, much time will be lost in division merely of the integument. And the lowest number of battery cells sufficient to heat the wire should be brought into the circuit.[1]

[1] For excision on the flat surface of a tumour or fungous mass, by the galvanic écraseur, straight needles of ivory or bone passed at right angles to each other, through the base of the part to be removed (the wire being then adjusted underneath, and the skin divided with a scalpel before contact is induced)—prove efficient guides. Without the preliminary insertion of such, we can never ensure that the wire will accurately follow the course we intend ; there is always a chance that some of the diseased tissue will escape ; a subsequent application of Paquelin's thermo-cautery is then constantly needed.

Steel needles, especially if inserted closely to one another, or if several have to be employed, divert much of the current ; and proportionately impede division of the tissues. Could *curved* guides, sharp enough to be passed through the tissues, be made of some non-conducting material, the advantages of the galvanic écraseur would be greatly enhanced. The writer has long endeavoured to obtain such ; but hitherto without success.

The lymph-gland at the inner side of the saphenous opening in the fascia lata, usually first receives secondary infection; which subsequently attacks the superficial inguinal lymph-glands. Any obvious enlargement of these organs indicates the necessity for excision, simultaneously with the operation for removal of the primary cancer.[1]

Any tenderness of these lymph-glands, even without enlargement, should also induce their removal,—a task (in consequence of their superficial position, and normally large relative size), not attended with difficulty; or involving any special risk.

The necessity for such prompt action is indicated by the fact that when enlargement has been but very recently noticed, and is only slight; it is usually found after excision that the contained cancerous parenchyma is in an advanced stage of softening (liquefactive degeneration). The inference being that, when the lymph-gland tissues here become infected, the subsequent morbid changes progress with extreme rapidity.

When neither of these two signs of secondary infection can be detected, the most prudent course would evidently be to treat each case on its own merits. In a cancerous growth which is of many months' duration, and has deeply infiltrated the tissues, to proceed upon the same lines as in cancer of other localities,—to assume the presence of lymph-gland contamination as a matter of course; and to remove the glands certain to have received the infection in due order, by the trivial incisions necessary for that purpose.

In a malignant sore however noticed but recently; in which the disease is evidently superficial; in which there is no extensive ulceration, and no marked impairment of the general health,—it is evidently not requisite to operate on the

[1] Enlargement of lymph-glands secondary to a primary malignant tumour or ulcer,—in the natural track ordinarily followed by the infection,—must be looked on as a sure indication of secondary deposit in these organs. Although instances have occurred,—especially in these inguinal glands,—of subsidence of such enlargement subsequently to operation for removal of the primary disease,—(in which cases the increase in bulk must have been merely inflammatory); these exceptions are of too phenomenal rarity to impugn the validity of the rule.

suspected lymph-glands with the promptitude demanded by those local cancer-deposits, characterised by rapid infection.[1]

In such a case, it will be best to maintain a close watch over the patient for several months subsequently to the primary operation ; and to remove the lymph-glands in question, at the slightest indication of suspicion ;—the rapidity with which the secondary deposits tend to involve the deep and inaccessible iliac glands, &c., indicating the dangers of delay.

Epithelioma of the Genital Organs in both sexes also secondarily infects first the superficial inguinal lymph-glands. After operation in these cases, local re-appearance is exceptional ; it is nearly always the secondary deposits which ultimately prove fatal. Re-appearance therefore may ordinarily be prevented by removal of these organs at the same time as the primary mischief,—in all but very recent instances. Infection does not usually take place until the cancer has been in existence many months.

XIX

THE great majority of epitheliomatous growths or ulcers on the Skin are well known to begin in ordinary warts, when irritated—whether unavoidably, as by the continued friction of clothing ; or by more preventable agencies.

The very acute and almost invariably fatal *melanotic sarcoma*, arising from pigmented warts ; points to the necessity for prompt destruction of the latter, whenever they make their appearance. In both instances, prevention could obviously have been effected with the greatest ease ; by a routine destruction of these trivial lesions,—especially when they occur in situations prone to continuous irritation. The malignant disease may be with justice regarded, as almost always a consequence of neglect.

[1] The remarkable variations in rapidity of secondary lymph-gland infection produced by malignant disease of identical kind attacking different localities, is not easy of explanation. It is especially marked in epithelioma,—varying in different local examples of this from a period of weeks to one of many months, or even of years.

The introduction into surgical practice of cucaine hydrochlorate, by robbing all such trivial operations of their terrors, should exert an important prophylactic influence ; in respect of the two forms of cancer here in question.

Epithelioma arising at the junction of skin with mucous membrane, similarly begins in conditions easily capable of being remedied. Many such cases appear to owe their origin to the injudicious use of nitrate of silver.

Whenever a chemical escharotic has to be applied for the purpose of destroying a raw surface which obstinately refuses to heal, the stick potassa fusa will ordinarily be found the most efficient and satisfactory; possessing the three advantages that it penetrates deeply; that the caustic action can readily be terminated by contact with water ; and that the attendant pain then ceases instantaneously.

The only drawback is the rapid and vigorous action of the salt. In the case especially of facial lesions, a very brief application only is necessary ; and care is requisite that the destruction shall not extend beyond the diseased area. Such an occurrence is easily guarded against by very slightly moistening the stick, so that no superfluous moisture may pass over the healthy skin ; by carefully mopping up such from time to time with a pledget of dry cotton wool ; and by holding one of the latter saturated with water over the skin immediately below (the patient being supposed to be sitting upright). If any bleeding take place before the growth or infiltration is completely destroyed ; the stick should be immediately withdrawn,—and not reapplied until the parts are fairly dry. A small piece of *iron-lint* (lint soaked in liquor ferri perchloridi fortior, and then dried), is a most useful styptic for this purpose, as for troublesome hæmorrhages elsewhere ; it should be applied with firm pressure.

It is best to have at hand several pledgets of cotton wool, some previously moistened with water, others dry ; to keep one of the former below the lower margin of the part to be destroyed, and to change it two or three times for a fresh one. The stick slightly moistened with water must be pressed upon the middle of the diseased tissue, and slightly rotated ; until the latter appears completely converted into a pasty eschar. It will be generally found most convenient to hold the stick, previously scraped at one extremity nearly to a point, and with the other wrapped in stout paper, in the hand; rather than in a holder. With these precautions there cannot well be any further destruction of skin than is absolutely needed. All caustic action ceases directly a pledget of cotton

wool saturated with water, is placed over the slough. The deep and rapid penetration of this salt; together with the readiness of control, and the subsequent immunity from pain; combine to make it far preferable to such far more tedious applications as the chloride of zinc paste, &c. Even the transient suffering thus involved may be prevented or at least greatly lessened, by a previous hypodermic injection of cucaine.

For a chronic ulcer or infiltration, the above proceeding will generally be found most suitable; as a wider destruction of infected tissue can be thus secured at a far less cost of bleeding, anæsthesia, and mental anxiety &c. than by any cutting operation. For a warty growth on the other hand, especially when on the face or in similar sites where the question of a subsequent mark is of particular importance, the latter proceeding (which enables accurate adjustment afterwards and union by first intention) will probably be selected. General anæsthesia by ether &c. will then often secure a better result than cucaine hydrochlorate; as greater deliberation can be exercised when the patient is perfectly unconscious.

When the Skin of Cheek, Nose, or Eyelids is the seat of epithelioma; the superficial glands in front of the ear, over the masseter muscle, and in close connection with the parotid, —first betray secondary infection; subsequently the superficial and deep cervical are rapidly implicated in succession. Those under the lower jaw may become enlarged at the same time.

Owing to the abundant lymphatics, and their deep connections, any evidence of lymph-gland infection (even when apparently limited to a single gland), is of very evil augury. It is of special importance in these cases therefore to eradicate the primary growth or sore before the infection has had time to extend by the lymphatic system; and subsequently to be on the watch for any local area of tenderness where the dangerous glands are situated. The small size and the site of these organs preclude attempts at extirpation before there are manifest indications of secondary deposit in them.

It is only the more superficial which in this neighbourhood can be removed, with probable advantage. When the deep cervical glands, in contact with the large blood-vessels, are implicated, it is not ordinarily possible to procure

even prolongation of life by an attempt to dissect them out. Concurrently with cancerous growth in these will invariably co-exist deposit in still deeper glands, perfectly inaccessible to the operator.[1]

Rodent ulcer (*cancer of hair-follicles*) rarely attacks the lymph-glands—and is commonly asserted never to do so.[2]

The difficulty of securing its permanent extirpation therefore depends upon primary local conditions,—more especially upon infiltration of the periosteum when the disease has long passed the recent stage. Free destruction of the deeper tissues by the stick potassa fusa, will usually permanently eradicate the diseased area when that occurrence has not yet taken place; or if the lesion is too near the eyeball for safe application of the caustic salt, the same end effected by Paquelin's thermo-cautery, the eyeball being judiciously guarded by ivory spatulæ. With a very extensive and chronic ulcer, the persevering application of the last-named instrument will greatly ameliorate, if it does not wholly cure.

[1] The course of lymph-gland enlargement after removal of a malignant growth, is sometimes useful for diagnostic purposes. In a man still under the writer's care, from whom an epithelioma of the lower lip was removed in May, 1889, by the usual V-incision; (after repeated applications of some very acrid ointment by a quack in the north of England); the deep cervical glands under the right sterno-mastoid muscle subsequently became considerably increased in size. The glands under the lower jaw, (in contact with the sub-maxillary) which invariably first receive secondary deposit, in these cases, were entirely unaffected; and their immunity went far to negative a diagnosis of 'recurrence,'—in spite of the suspicion which always attaches to any lymph-gland affection under such circumstances.

The hypertrophy of these cervical glands has not increased since first noticed (in June); and is now (December, 1889) improving under treatment. It was doubtless a result of the previous irritating (arsenical?) applications. The patient is otherwise in good health.

[2] In a case a few months since in the Cancer Hospital, with a large atrophic rodent ulcer involving the right lower eyelid and temporal region:—of many years' duration, and of primarily syphilitic origin,—was found a round tumour as large as a bean, at the edge of the sterno-mastoid on the same side, an inch below the ear; having exactly the appearance, and occupying the same situation as one of the superficial cervical lymph-glands. After removal the microscopic appearances were those typical of rodent ulcer; columns of small-cell formation,—embedded however in very thick white fibrous tissue. No lymph-gland structure was discernible; but under the circumstances little doubt could be felt that the growth was a lymph-gland, with normal tissues replaced by the slowly-advancing and irritative rodent-ulcer parenchyma.

The exceptionally slow progress and remarkable localisation of this variety of malignant disease, lend special encouragement to such attempts, even when the first manifestations are long past.[1]

XX

WHEN one of the *extremities* becomes the seat of malignant disease; the tissue first attacked together with the pathological variety of cancer in question require careful consideration in the selection of such measures as will tend to preclude re-appearance.

The acute course of *melanotic sarcoma*, its very rapid infection of the lymph-glands; and its not infrequently wide dissemination by the subcutaneous connective tissue; are clinical features which greatly militate against the ultimate success of operative measures.

The early lymph-gland infection by a still insignificant primary lesion often capable of obliteration with great facility; suggests that better results would be more frequently attained by prompt obliteration of those glands which are certain to have already received deposits—whether or not there may be any palpable indications of this occurrence. The removal of axillary lymph-glands in case of such growths on the hand or arm; of the superficial inguinal, and the glands about the saphenous opening, when the lower extremity is attacked,—are measures which obviously involve little difficulty or risk; and which will greatly contribute to lessen the prospects of 'recurrence' in examples of melanotic sarcoma,—a variety of cancer, in which the primary area of disease is almost always very small.

Moreover the exuberant growth of these secondary tumours in the lymph-glands, (frequently resulting in huge fungous masses on the one hand; or on the other, of proportionately deep ulcerative excavations)—also points to the inference that, when nothing more than prolongation of life

[1] A (relatively) large amount of compact fibrous tissue is microscopically noticeable in thin sections of rodent ulcer,—particularly in the more recent parts of the infiltration;—and aids in accounting for the chronicity of the disease.

can be anticipated from operative measures ; timely removal of these organs would really effect more to promote that end, than obliteration of the primary lesion. That the former operation should rank in importance before the latter (often very considerably).

The following cases may be cited in illustration :

A middle-aged woman has lately (in December, 1889) been admitted into the Cancer Hospital with a large sloughy fungous ulcer of the lymph-glands below the left groin ; and smaller melanotic nodules in the subcutaneous tissue around ; the primary lesion being a tumour of the corresponding great toe of three years' duration, previously operated on at a general hospital ; and still no larger than a hazel-nut. The duration of life will plainly depend almost wholly upon the course of the secondary deposits ; will not be affected by the little growth on the toe, in any appreciable degree.

G. F., an originally robust young man, aged 28, presented himself with a large mass of diseased glands in the left axilla ; and subsequently died with very extensive visceral, and subcutaneous growth ; sequelæ of a pigmented warty growth on the left forearm, excised before the patient came under observation ; but of which operation the scar (healthy to the end) was a small linear one not more than half an inch long.

A woman also recently died with ascites, due to exuberant melanotic masses in the peritoneum, and abdominal viscera ; and with extensive disease in the lymph-glands of the left axilla ; the primary growth having occurred on one of the fingers, and shewn by the cicatrix (healthy) to have been of the most insignificant dimensions. In this case, although the axillary tumour was deeply pigmented, those of the peritoneum and abdominal viscera remained (to the naked eye) perfectly free.

In both the two last-named, the visceral deposits were more recent than, and obviously consecutive to, the axillary.

Sarcomata originating in the *periosteum* differ notably from ordinary examples of the preceding in that the primary tumour tends to attain large (often enormous) bulk ; and so contributes much more conspicuously towards a fatal termination. At the same time, the lymph-glands and viscera become extensively and widely implicated.

A distinctive (though not wholly peculiar) feature of

these is the production of numerous secondary tumours in different parts of the skeleton. A general systemic infection appears to take place; and the nuclear particles circulating in the blood current, to evince a special affinity for bone-tissue.

The often very marked improvement in general health after amputation of the limb for one of these growths; followed by equally marked and rapid relapse; together with the wide dissemination found *post mortem* to have taken place; probably lent most countenance to the pathological views which formerly regarded cancer as a constitutional disease. It has been pointed out (in reference to scirrhus), how secondary infection of the Bone-Marrow favours extensive diffusion; the excessive vascularity, loose friable consistence, and absence of fibrous tissue, are histological peculiarities of the growth now in question, which aid in accounting for the above phenomenon.

The obscurity which usually involves the first development of periosteal sarcoma,—the fact that young and otherwise healthy individuals so often become its subjects,—natural reluctance to undergo the severe measures indicated for its removal,—and the known ill-success of these in the majority of instances,—all tend to invest this variety of cancer with peculiar fatality. By the time the real character of the complaint is recognised,—(by which period the neoplasm will almost assuredly have attained considerable bulk)—distal secondary deposits will almost always have already been planted; and these, in the bones and viscera (as well as in the lymph-glands).

Removal of adjoining chains of the latter organs cannot therefore be expected to be attended by the same beneficial results; as when the superficial tissues are primarily attacked by cancer. The gradual progress from organ to organ, or from tissue to tissue, which characterise the early stages of malignant disease in the latter case, are here wanting. The loosely-cohering cell-particles of these soft sarcomata very speedily pass into the circulation; with the results above noted. All the clinical phenomena, as well as comparison of

the deposits *post mortem*, indicate infection from a single primary centre.[1]

The difficulty in successful treatment mainly lies in securing a diagnosis of the malignant disease while still localised. Although extremely difficult, and in such cases as those alluded to in the note plainly impossible; there seems reason to believe that by a recognition of the conditions likely to produce cancer, (by being, as it were, on guard with a patient who has been subjected to these)—better results might often be attained. It frequently appears that no suspicion of malignancy has been entertained, until the growth has made considerable progress.

The subjects of periosteal sarcoma, as has been remarked are often young and apparently robust. No indication of predisposition to cancer can usually be traced. Very commonly the patients appear to be the last in whom a malignant neoplasm might have been expected to develop. And the localities are not such as (like the sexual organs in women, and the buccal mucous membrane in men) are familiarly encountered as the seats of cancerous formations.

There is nearly always a history of *injury* in these cases; and not seldom of considerable *mental depression* as well. The success of surgical measures for extirpation would seemingly be best promoted by a mental habit of regarding with extreme suspicion any tumour of bone which is noticed after mechanical injury of any kind; and particularly after a combination of these two precedent factors. Such a growth in localities amenable to operative procedures, coming on soon after a blow or fall; showing a tendency to rapid increase; very painful; and not yielding speedily to appropriate treatment; should be assumed to be malignant; and should have its real nature promptly cleared up by the usually harmless measure of an exploratory incision under anæsthesia.[2]

[1] Some cases reported by Mr. Barwell ('Acute Traumatic Malignancy,' *British Medical Journal*, February, 2, 1882); shew the occasional rapidity with which such blood-contamination takes place.

[2] It is unfortunate that the comparatively late phenomenon of lymph-gland enlargement is often the first clinical symptom which excites suspicion of malig-

The chronicity of *epithelioma* on the extremities has been adverted to; the growth or infiltration is ordinarily long amenable to comparatively mild surgical procedures; and may be most satisfactorily eradicated, as a rule, by caustic applications.

Amputation will not be requisite except in old-standing and neglected cases, as a last resort; the indication for it being implication either of the bone itself, or of the deep tissues immediately contiguous.

In all but recent instances, extirpation of the axillary lymph-glands (if the arm is the seat of disease); of the superficial inguinal (in epithelioma of the lower extremity);—will add greatly to the prospects of immunity. Failing this proceeding, a continuous watchfulness over the condition of the organs in question, will require to be maintained for at least a twelvemonth, subsequently to the primary operation.

The very gradual progress of epithelial cancer is most marked, when (as often happens) *scar-tissue* is attacked. Commencing, after some trivial injury, in the midst of an old cicatrix, and as a small excoriation or ulcer which obstinately refuses to heal; the disease extends only by extremely slow and imperceptible degrees. Surrounded by non-vascular tissue of low vitality, the actual presence of cancer long remains doubtful; the sore being regarded only as a chronic, indolent simple ulcer of the part. No affection of the lymph-glands becomes obvious often for several years.

The surrounding fibrous tissue helps materially to obscure the ordinary characteristic features of a malignant infiltration; and often the nature of the latter is not suspected until secondary deposits take place. On the arm or trunk, the attendant pain (exceptional in any other chronic sore), combined with resistance to treatment by the ordinary applications, will commonly serve to indicate the presence of cancerous cell-growth; on the lower extremity, the inefficiency of all local measures, when combined with the necessary rest. Excision of a small portion of the margins, subsequently examined by the microscope, is however the most crucial test; and one, with ordinary care, to be fairly relied on.

But as non-malignant chronic ulcers are prone to set up malignancy, as a secondary process; as the latter may begin at any time,

nancy; or which is awaited; in order to 'clench the diagnosis,' before any radical measures of treatment are proposed.

and probably in any part of the ulcer; and as it is obviously impossible to subject every portion to such examination; doubtful cases will still occasionally arise. And in these the best rule will be (by caustic potash, or the like) freely to extirpate every chronic sore of this description, which placed in suitable conditions, obstinately refuses to heal; subsequently perhaps aiding the normally low tendency to cicatrise, by skin-grafts. It is not safe to protract such a step until there is palpable lymph-gland enlargement. In such cases as those described, (supposing, for example, the initial seat of the lesion to be the scar of an old and very extensive burn)—owing to the previous wide and deep destruction of parts,—the condition not unfrequently looks much worse than it really is. Although in reality localised to the scar, the absence of underlying tissue is apt to give rise to suspicion of infiltration of bone or periosteum, (which as already remarked would necessitate an amputation). Much caution is therefore essential in the surgical treatment to be advised. It is obviously most unwarrantable to resort to the last-mentioned very severe measure, until milder ones have first received a thorough trial, and have failed.

Many cases of the fibrous tissue hypertrophy designated '*keloid*' (i.e., false keloid, or keloid of cicatrices; the application of the same title by Addison to circumscribed scleroderma, involves some undesirable ambiguity),—exemplify the tendency of connective-tissue growths to pass in later years into a more embryonic stage of development; and to become truly cancerous (spindle sarcoma). The occurrence of malignancy is apt to be precipitated by incomplete removal—followed almost necessarily by prompt 'recurrence,' and by more rapid growth. While still non-malignant; and, while exhibiting on microscopic examination, only compact and well-organised fibrous tissue; they can usually be satisfactorily extirpated without risk.

XXI

SOME confusion is not infrequently noticeable in medical reports between Lympho-sarcoma (primary cancer of the lymph-glands); and Lymphadenoma (Hodgkin's disease).[1]

[1] The term 'sarcoma' is moreover obviously liable to grave objection; although it has now passed into general use. The natural affinities of this

The distinction between the two,—as also between these and the familiar hypertrophic lymph-gland enlargement,—is clearly indicated by Dr. Sims Woodhead (*Manual of Pathology*) as follows :

I. *Lymphoma* = ordinary lymph-gland enlargement, strumous or otherwise. Consists of ordinary lymphoid tissue in excess,—is generally the result of simple hypertrophy.

II. *Lymphadenoma*, or Hodgkin's disease. Reticulum in excess, and becoming fibrous ; increased number of endothelial plates ; when becoming fibrous, great diminution in number of the lymphoid cells, which appear compressed out of existence by the fibrous tissue.

III. *Lympho-sarcoma.* Scanty reticulum ; corresponding diminution in number of endothelioid plates ; enormous increase in that of the lymphoid cells.

To the last it may be added that the cancerous lymphoid cells exhibit on a smaller scale similar features to those which are presented on the larger by such neoplasms as epithelioma or scirrhus ; being distinguishable from the normal cells by the relatively huge size of their nucleus.

A correct appreciation of these pathological differences would seem to be of the greater importance ; in that primary cancer of lymph-glands is almost invariably at first confounded with simple lymphoma ; and is subjected to the ordinary treatment for those irritative or inflammatory conditions which excite the latter. The presence of malignancy is hardly ever recognised until many weeks or months, have thus been sacrificed.[1]

As the infection tends rapidly to implicate the adjoining glands, and then the more remote in order of proximity ; an early diagnosis is the more essential to successful eradication.

When it has been found possible to effect this with promptitude ; the capsular structure of a lymph-gland, is *prima facie* more favourable to the complete removal of cancer-parenchyma ; than is the histological arrangement of

pathological variety would be better expressed by some such designation as 'lympho-carcinoma.'

[1] Prompt recognition of a lymph-gland cancer is probably one of the rarest events in surgery.

the non-encapsuled and infiltrating varieties of malignant disease.

It is rare, however, to encounter a case in which several lymph-glands have not become already implicated; in which the primary focus of disease, originally commencing in a single organ, does not now consist of several closely matted together. In later stages also, the malignant cells tend to break down or absorb the lymph-gland capsule; and to invade the tissues around. When, as not seldom happens, the subcutaneous tissue becomes thus infected, wide-spread dissemination ensues; and the skin of trunk and extremities may become extensively studded with large and small secondary tumours.

Simple lymphoma being one of the most prevalent and familiar of surgical maladies; and the cancerous enlargement, in early weeks of development, being often painless; and not evincing any physical characteristic (such as marked hardness), which would serve to arouse suspicion,—primary cancer of lymph-glands is perhaps the most obscure and insidious of all the varieties of malignant disease.

The principal point to be remembered in order to secure more timely recognition is the extreme suspicion under which the appearance of lymph-gland enlargement,— i.e. without direct and well-understood cause; such as suppuration in the vicinity, diphtheria, &c.—in a middle-aged or elderly individual, should always lie. The majority of these cancer-deposits (with some exceptions), occur in or after, advanced middle-life. And while in younger subjects, the lymph-glands undergo hypertrophy under the influence of comparatively trivial excitants; in those of more mature age, such tendency is much less marked, and is even somewhat exceptional,—failing some grave cause at work. *Any marked lymph-gland enlargement in advanced life is, under such conditions, probably malignant; and may be, with most safety to the patient, so regarded, prima facie.*

The history of origin almost always points strongly to malignancy; the enlargement is dated from a blow or fall,—not an ordinary cause of lymphoma in the young,—in whom some septic absorption from neighbouring tissues (as in the

case of cervical gland enlargement, follicular tonsillitis, carious teeth, otorrhœa, &c.) is generally manifest.[1]

The two combined features of mature age, and of enlargement dating from a mechanical injury,—found in any given case,—point strongly towards malignancy. And when after a brief period of local treatment, the growth is still found to be progressive, this suspicion will be considerably heightened.

Viewing the rapidity with which the cancerous process extends to similar organs next in the chain, and the disastrous consequences of secondary infection, it is plainly unsafe to essay more than a very brief period of local treatment, calculated to promote the disappearance of the swelling ; on the supposition that this is merely inflammatory. If no improvement then ensue, an incision, more or less exploratory and tentative, should be promptly resorted to ; and supposing that a malignant deposit is detected, should be followed by the removal, not only of the organs manifestly diseased, but of all others in the vicinity, which can be excised without special risk,—whether palpably implicated or not.

Of localities amenable to surgical measures, the situation which lymph-gland carcinoma most affects, (and in which therefore its onset in likely subjects is most to be looked for), is among the deep cervical lymph-glands under the sterno-mastoid muscle.[2]

Pain is not at first a marked phenomenon, and may be entirely absent, until the growth has attained considerable bulk. In non-ulcerated cases, it seems largely to depend upon tension ; and upon the resistance offered by the gland capsule, or by other fibrous envelopes, to the multiplication of the proliferating cells ; being absent or nearly so, when

[1] The influence of mental distress, in generating lympho-sarcoma, cannot be estimated with certainty. Many persons speak of great recent anxiety in addition to the mechanical injury ; and the state of the mind, under such circumstances, probably predisposes. In the case of localities more remote from injury, such as the abdominal cavity, and mediastina ; many of the cancerous tumours in which belong to this class,—a previous history of troubles would demand careful consideration.

[2] Next to this perhaps, as the locality next most exposed to mechanical injury, the inguinal lymph-glands.

there is exuberant and unrestricted local growth ; when the fibrous tissues of the individual are soft and easily eroded.

The general health does not fail till late, unless (as often happens) the patient was previously weakly ; and the causation-history will usually contribute far more towards the early recognition of this malignant neoplasm, than will any subjective or objective phenomena.

XXII

SUMMARY.

I. CANCEROUS disease, of all varieties, is at the commencement, purely local. There is invariably but a single primary focus of cell-proliferation,—all the subsequent phenomena resulting from infective particles of protoplasm thence derived. (See *General Theory of Cancer-Formation*, J. & A. Churchill, 1889.)

II. A second stage, in which infection by these detached cells, nuclei, or nuclear particles is mechanically conveyed to distal organs, follows the first, (in almost all forms).

As a rule, the nearest lymph-glands first receive these germs ; then pass the infection to the next beyond, in order of proximity,—subsequently to remoter parts or tissues.

III. In the third stage, the infective particles freely pervade the blood-current ; multiple tumour-formations arise ; and the disease may be considered general.

In the more acute kinds, this systemic infection takes place very early ; in the chronic, not until a comparatively late period of development, (when the fact of its occurrence is often more or less obscured by the advanced local cancer-phenomena).

In malignant disease of milder type, (such as Rodent Ulcer), the two latter stages are ordinarily absent.

IV. The desideratum of successful surgical treatment is the potentiality of completely destroying all infective cells or cell-particles, while the new growth is still in its first stage,—of localisation to one limited area of tissue.

V. In the majority of cases which are submitted to surgical procedures, the attainment of this object is precluded

by a variety of considerations; many of which are popular, and easily susceptible of remedy. By the correction of traditional errors and fallacies; as also by the diffusion of some slight acquaintance with the laws of health bearing upon this grave subject,—malignant disease would in numerous instances be either entirely obviated; or would be encountered in such a form as to render its eradication a matter of comparative ease.

VI. By due recognition of the predisposing and exciting causes of each variety of Cancerous new-growth; there appears reason to hope that in the future, many more cases may be recognised in an incipient (and therefore potentially curable stage of development), than has hitherto ordinarilytaken place.

VII. The predisposing causes may be shortly summed up as: *any condition or occurrence which tends to lower general or local vitality.*

Mental distress and *worry* are the most important and most usual precursors of cancer, (in its especially prevalent varieties).[1]

VIII. Ranking next in gravity to these may be mentioned *advancing age*;[2] prolonged illness (especially when of a *neurotic*

[1] Hence the increase of cancer in recent years, as indicated by the statistics of the Registrar-General, is accounted for; although, for many reasons it is impossible to place implicit reliance in these; or to draw therefrom, any very trustworthy inference.

[2] Although the mortality from cancer, (i.e. the number of deaths in proportion to the number of individuals living),—'goes on steadily increasing with each successive decade until the eightieth year,' (Sir J. Paget, *Surgical Pathology*, p. 798); the view that this is 'a disease of degeneracy' can hardly be received, without much qualification. The most typically 'malignant' and rapidly fatal cases occur in the young and robust; by far the larger number of malignant growths are seen in the middle-aged (æt. 40–50, Paget); the relative virulence of such neoplasms belonging to the same species appears largely to vary with the activity of the circulation, and general vitality of the subject,—being most marked in individuals conspicuous for these qualities. Whereas, on the other hand, the cancerous tumours, or ulcers of external parts encountered in the very old, are usually much more chronic, more localised, more prone to run an 'atrophic' course, and less likely to re-appear after removal, than at an earlier period of life. Advanced age, in short, appears to be extremely unfavourable to rapid cancer-growth; on the theory in question, it should have the reverse effect,—if tissue-degeneracy favours origin, it should, as a matter of course, also encourage subsequent development.

It may be remarked however that age as measured by years of existence is no

character, such as the various paralytic diseases): insufficient sleep: prolonged and exhausting labour: menorrhagia: syphilisation: habitual alcoholism, &c.

IX. The fallacies involved in views of Heredity as a predisposing cause of malignant disease have been exposed by Mr. Harrison Cripps (*Essay on Cancer of the Rectum*, and elsewhere); by the writer in an analysis of more than 1,000 cases (paper, '*Is Cancer Hereditary?*' read at Cardiff Meeting of British Medical Association, published in 'British Medical Journal,' October 10, 1885; see also paper, '*Etiology of Cancer: Statistics and Remarks*,' in 'Lancet,' December 25, 1880); and by others.

X. In complicated questions of pathological causation, it is dangerous to rely upon arguments or theories based solely upon numerical grounds; unless preceded by a careful investigation of individual cases; and until a probable relationship of cause and effect,—or at the least, of frequent sequence,—has been proved to occur in a large number of particular instances. (Without such 'Control-experiment,' it would be easy to make a *reductio ad absurdum* of assertions based *only* on a foundation of statistics; and thus gravely to demonstrate the most ridiculous and impossible connection between widely separated classes of phenomena.)

For this reason, and because they appear to be totally unsupported by clinical experience, it is impossible to attribute validity to supposed influences of soil, climate, race, diet, &c., as predisposing causes of malignant disease; in any higher degree than as these may be incidentally involved in the conditions already stated.[1]

more than a merely approximative test of general vitality on the one hand; or of local tissue-degeneracy on the other. Many individuals are for all practical purposes much younger at 50, than others at 30 or 40.

There is reason also to believe that many deaths in extreme old age, certified as resulting from senile decay, gastritis, enteritis, &c.; are really due to unsuspected visceral cancer-formations.

[1] The supposed immunity of the Jewish race from cancer is a current fallacy, not corroborated by facts. The prevalence which has been ascribed to cancerous maladies in 'towns situated on rivers which periodically overflow their banks,'—presumably centres of busy trade and competition,—is a matter of *à priori* probability on grounds here put forth.

XI. The *exciting* causes of cancerous disease may be expressed in brief as 'Local Cell-Irritation.' In particulars of detail and of mode of application they vary with the special variety.

They may almost invariably be ascertained without difficulty in any recent instance; but when the malady is of long standing, not infrequently become obscure,—the provocative factor having been of trivial and transient character; whereof all trace has speedily passed from the memory. The immediate antecedents of the more prevalent and familiar kinds may be stated in general terms as follows:

In Epithelioma (Cancer due to the proliferation of pavement epithelium) *continuous* mechanical irritation.

In the Malignant Adenomata which arise from the cells of glandular epithelium, mechanical injury, (usually sudden, and not continuous) in a small minority. In the great majority, mental distress and various other neurotic conditions.[1]

Cancerous growths of connective-tissue origin (True Sarcoma) appear usually to originate more immediately in sudden rupture or other injury of connective-tissue elements by a blow or strain.[2]

[1] The Cancer Hospital statistics, based upon 9,590 cases of (Mammary) Scirrhus, ascribe 11·5 per cent. of these to mechanical violence in some form or other. A nearly identical estimate is made by Dr. Gross and other observers.

The influence of neurotic antecedents is most conspicuous in those varieties of malignant disease which attack the sexual organs of women.

It is not possible to draw a hard and fast line between the mode in which the cell-irritation needed to originate the several species of cancerous neoplasm must be applied. Thus an Epitheliomatous sore may result from a *sudden* injury; a Scirrhous breast may be the consequence of *long-continued* irritation of the nipple; Rectal Cylindroma may be the sequel of *chronic* congestive conditions of the rectal mucous membrane; and so on.

The normal cyclic desquamative changes which take place in the uterine mucous membrane afford an instructive example of coarse histological modifications of structure intimately dependent upon and connected with conditions of the central nervous system; and may be put forward in reply to objection that the view of cancer as a (primarily) local disease, is incompatible with its apparent causation by mental emotion, &c.

[2] The injury is frequently of the most trivial and transient character, hardly noticeable at the time; or, soon afterwards quickly forgotten. The causation history of sarcoma is thus frequently obscure; and its elucidation may depend largely upon the intelligence of the patient. The following is a typical instance.

Hugh F. a patient admitted into the Cancer Hospital in September 1887, under the care of Dr. Marsden; who had previously attended him for several

XII. An encapsuled malignant tumour is practically the whole (local) disease; and unless infective germs have previously become transferred by the agency of lymph- or blood-currents to other organs, can be excised with little or no prospect of 'recurrence.'

On the other hand, with unencapsuled cancer-formations (which constitute the great majority of examples met with); the palpable tumour occupies but a portion of the area attacked by disease; and of the tissues infiltrated by invisible cancer-cells, nuclei, or nuclear particles.

XIII. In all surgical procedures for extirpation of a malignant growth, it is essential to aim at the complete removal of this surrounding zone,—in addition to that of the palpable tumour-formation.

XIV. It is therefore necessary to estimate carefully the relative susceptibility of the various tissues adjoining,—to malignant infection; and to adjust the operative measures demanded in each particular case to such considerations.

XV. The secondary deposits of cancer constitute the principal obstacle to cure by operative treatment.

XVI. The feasibility of prompt operative extirpation

years. Aged 38. Disease of 21 years' duration. No family history of cancerous disease. The patient's account was that in 1863, when a boy at school, he had 'missed his kick' at football. From the results of the muscular strain, he was laid up at home for a quarter; and a tumour appeared in the abdominal wall which was removed; but speedily recurred.

In 1887, 10 operations had been performed by various surgeons; and in addition the man had undergone many months of caustic applications by the notorious Paterson. When admitted, a huge fungous mass as large as a melon grew from the abdominal wall, above and slightly to the right of the umbilicus; the tissues at its base were deeply infiltrated, and a slough occupied the middle of the tumour. Scattered around, and arising apparently from the subcutaneous tissue, were numerous polypoid excrescences varying in size from that of a pea to an orange. No pain was complained of; but the general health was fast breaking down. After palliative excision of the large tumour with the galvanic écraseur (by Dr. Marsden), the microscopic examination revealed typical spindle-celled sarcoma structure.

Hugh F. was an auctioneer, an intelligent, and originally robust young man; who remembered more about the commencement of his illness than might have been expected after such a lapse of time.

The preceding is an example of exceptionally *chronic* sarcoma-formation. Of similarly exceptional *acute* ditto, arising from the like causes, Mr. Barwell's cases (*Brit. Med. Journal*, Feb. 2, 1882) have been already referred to.

mainly depends upon early diagnosis of the malignant process. This in turn hinges, not only upon the accurate and judicial estimation of symptoms in any particular instance; but upon due recognition of the causes (predisposing and exciting) of Cancer-formation.

XVII. What passes under the designation of 'Recurrence,' is the re-appearance (in macroscopic form) of disease resulting from the continued growth of malignant and infective cells, nuclei, or nuclear particles of protoplasm;—residual after measures apparently obliterating the cancerous area,—but only purporting to have done so.

XVIII. The adjacent chains of Lymph-glands being the organs most conspicuously exposed to secondary infection; it is essential to remove such, (in the case of all varieties prone to infect them), simultaneously with the primary neoplasm.

XIX. In every instance of malignant cell-growth, in which infection of Lymph-glands is prone to take place early, and is then likely to involve ultimately fatal consequences;—it is not in accordance with prudence, to defer the removal of these organs, until the malignant deposit therein has manifested its presence by marked increase in their bulk,—a physical condition not usually taking place until after a certain lapse of time; during which the infection is being insidiously conveyed to organs or tissues still more remote, and insusceptible of surgical treatment.

XX. The Lymph-gland path along which the more prevalent and familiar local Cancer-formations disseminate infection; is, for the most part, definite and in accordance with rule, during the early stages of growth.

XXI. Apart from the question of successful eradication, the removal of infected Lymph-glands will often contribute far more towards the prolongation of life, and preclusion of subsequent suffering,—than will excision of the primary neoplasm.

XXII. After the operative removal of any cancer-growth the patient must be kept under close and systematic observation, for a subsequent period (of about 2 years). The importance of removing any re-appearing nodules, &c. in an

early stage, is (on account of their proneness to diffuse infection) at least as great as in the case of the first developments of the malignant process.

XXIII. The general diffusion of malignant particles by the Blood-current; together with the insidious growth in the Marrow of bones,—which characterise the later stages of some varieties of Cancer; render all operative measures (unless confessedly undertaken for purely palliative purposes) futile, whenever there exist any indications of such a condition.

XXIV. Whenever cancerous disease has passed into such a stage that surgical measures for its (seeming) extirpation would involve grave risk to life; it rarely happens that any ultimate advantage (at all commensurate with the dangers incurred by the patient), is thereby attainable.[1]

XXV. It is not always possible to ascertain the tissue origin of malignant growths encountered in a very advanced stage,—by the aid of the microscope. And for diagnostic purposes, it is rarely safe to rely *solely* upon the indications afforded by that instrument.

XXVI. Early resort to an exploratory incision is a precautionary measure of the utmost value, in the case of any doubtful tumour-formation. (Or of primary Lymph-gland enlargement in the aged.)

XXVII. All cysts in the female breast are prone ultimately to develop malignant phenomena. In a less degree, most benign tumour-formations of connective tissue origin, (Enchondroma, Fibroma, Osteoma, very rarely Lipoma) seem

[1] When a cancerous mass is irritated by partial and ineffectual attempts at removal, the symptoms local and general are usually aggravated (*a*) by the subsequent shock and physical depression; (*b*) by the resulting local inflammation; (*c*) by the removal of any capsule, or contiguous fibrous structures, which may have previously acted as a barrier to the progressive cell-infiltration.

Unless for well-considered palliative purposes, therefore, it is not usually judicious to undertake any surgical measure of operation upon malignant growths,—which does not afford reasonable hope of the complete removal of all the visible tumour or infiltration. As previously pointed out, the resulting scar-tissue is an unfavourable nidus for the development of residual cancer-cells, when inconsiderable in amount. And hence much benefit may often be conferred by operations which effect the removal of the palpably diseased area,—but leave untouched some part of the surrounding infected tissues.

liable to pass into a more embryonic stage of cell-growth in the later years of life.[1]

[1] While the above was in the press, a case of 'Ossifying Enchondroma,' attacking the humerus, of 10 years' duration, and apparently passing into a malignant stage, was shown at the Royal Med. Chirurg. Society, by Dr. Chavasse (*British Medical Journal*, January 18, 1890). At the same time, a man was in the Cancer Hospital (under the care of Mr. F. B. Jessett), with a large tumour also on the humerus, and of 7 years' duration; and also rapidly developing malignant features.

APPENDIX A.

INCREASING PREVALENCE OF CANCER.

The following table affords an illustration of the neurotic antecedents which almost always immediately precede the appearance of cancerous phenomena, not of obvious mechanical causation ; and are also very often additionally present in cases of the latter class. In these they seem to be predisposing causes ; in the former, direct excitants.

The influence of mental or physical depression in generating malignant disease becomes the more marked and unmistakeable in proportion to the more or less comfortable worldly position of the individual, in the first place ; and in the second, to the extent with which we are enabled to become conversant with the circumstances of his or her previous career. Also to the degree in which we are enabled to exclude the agency of every other possible factor ; such as hereditary predisposition.

Although such particulars may seem trivial ; and the causes insignificant, in comparison with the effect ; yet their very constant occurrence as direct precursors of malignancy,—together with the absence of all other conceivable potential agencies,—invests them with considerable importance. They afford a plausible explanation of the increased prevalence in recent years, which has been attributed to cancer ; and which is only to be anticipated as the struggle for existence, becomes keener,—as the general wear and tear of life become more exhausting and incessant.

A history of neurotic antecedents is seldom absent in those varieties of cancer which attack the sexual organs of women.

The practical purpose to be served by citing these details ;—which are instanced as familiar examples only, capable of indefinite multiplication,—lies in the suggestion that any person exposed to such conditions, is predisposed to malignant disease ; so that any tumour-formation or ulcer then first appearing, requires proportionate circumspection, and watchfulness.

Disease	Age of Patient	Heredity	Causation
Malignant disease of ovaries	75	Nil	Wife of retired physician, in easy circumstances, with no children, leading a very retired sedentary life. No injury. Greatly worried by visit from relations, for whom domestic arrangements had to be altered; sleep at this time much broken. Within a few weeks, appearance of growth; rapid progress, and speedy death.
Cancer of uterine cervix (epithelioma)	40	Nil	Widow, robust in appearance, keeping apartments. Lost husband 1½ year ago; lately son had misconducted himself, and had greatly distressed her. Disease had been noticed 3 months.
Scirrhus of breast	35	Mother died of same complaint	Lady in good position. Had slight blow on breast from husband's elbow four months before appearance of tumour. Lost a brother 15 months previously; 2 months ago, some domestic worries about servants; did much work herself, and thinks she strained the arm.
Epithelioma of uterine cervix	43	Nil	Lady, wife of manufacturer; proclivity to alcoholism; for a long time, some worry about husband's business. Just before the appearance of the symptoms (of 6 weeks' duration), annoyance at misconduct of a son; and rest much broken in consequence.
Scirrhus mammæ	38	Nil	Wife of retired official, easy life, no family, 'worrying' disposition. No injury. A few weeks before tumour appeared, the death of a brother 'preyed greatly on her mind.'
Abdominal cancer (original site uncertain)	56	Nil	No injury. Husband a labourer, out of work for 6 months before disease appeared. Much trouble and semi-starvation.
Epithelioma of cervix	28	Nil	Actress in burlesques, &c. When first seen, had nursed paralysed mother for 2½ years; disease already far advanced.
Epithelioma of cervix	40	Nil	Three months before outbreak of disease, death of nephew. Patient grieved much; and nights were sleepless.
Abdominal malignant disease, (origin and precise variety uncertain)	63	Nil	Publican. Railway concussion 15 months before appearance of tumour; afterwards much worry about commencing new business, and consequent loss of sleep.
Scirrhus mammæ	40	Nil	No injury. Lost daughter, just before new growth became evident.

Epithelioma of cervix	45	Nil	Husband with heart disease, had been disabled for a year, and had been nursed by patient. Tumour of about the same duration.
Scirrhus mammæ	36	Mother's mother reported to have had cancer in calf of leg; patient does not know if death resulted	No injury. Hard work; severe illness and death of husband, a little before appearance of cancer.
Scirrhus mammæ	49	Nil	No injury. Re-married against wish of friends 6 months before tumour noticed; and states that the circumstances caused her great distress and anxiety.
Scirrhus mammæ	40	Nil	Hard work as attendant upon lady aged 80, upon whom patient had to wait night and day. Very little sleep for a long time. No injury.
Epithelioma of cervix	43	Nil	Son enlisted a year before onset of symptoms; patient 'has never felt well since.'
Epithelioma of cervix	47	Nil	Midwife; dates her illness from a particular week 9 months previous,—in which she attended '4 labours, and a funeral in the country.' 'Has never felt well since.' Vaginal discharge of 8 months' duration.
Scirrhus mammæ	71	Nil	No injury. Much trouble, 1½ year previously; having been an inmate of an infirmary with left hemiplegia for a whole year. Tumour of 15 months' duration.
Scirrhus mammæ	48	Nil	Wife of greengrocer. No injury. Seven children. Hard work. Climacteric. Left hemiplegia, following diphtheria, came on 13 months before appearance of new growth; lasted 6 months, and had not entirely disappeared when patient was first seen.
Scirrhus mammæ	59	Eldest sister died of same	Nursed husband 5 months; he then died and left patient penniless, though previously in good position. Cancer came on about a year after his death.
Scirrhus mammæ	51	Nil	Wife of retired colonel. No injury; highly nervous, anxious temperament; worry about pecuniary troubles, and unsatisfactory marriage of daughter, for a year before the growth was noticed.

APPENDIX B.

EXAMPLES OF CANCER-PRODUCTION IN GROWTHS (CHIEFLY CYSTIC), OF MANY YEARS' DURATION; AND ORIGINALLY NON-MALIGNANT.

Case I.

Cyst of left breast, stationary for 14 years; then undergoing rapid increase while the patient was nursing a sick husband. Excised and found to be filled with embryonic fibrous tissue, apparently of recent formation. No re-appearance.

Eliza S. Æt. 60. Married. Admitted into Cancer Hospital, April 5, 1886.

Duration of tumour.—14 years.

Family history of cancer.—Nil.

Causation.—A 'lump' in the breast first felt 14 years since; was then treated by a doctor, with the supposed effect of producing some diminution in size. Is certain however that a tumour has been present ever since; and that it remained perfectly stationary till 3 months ago. No injury. Husband seriously ill, 4 months previously; and some troubles before this.

Present state.—To outer side of left breast rather elongated tumour, as large as an orange, freely movable; with small projecting bosses. Is not so hard as scirrhus; no lancinating pain; no pain except when touched. Axillary glands very tender, and slightly enlarged.

Breast excised April 10, 1886; and axillary contents removed at same time. The tumour proved to be a cyst, filled with densely-packed vegetations.

Lymph-glands found to have a yellowish deposit in centre. A microscopic examination shewed the vegetations to be composed of newly formed fibrous tissue, in parts very embryonic; here and there also, large collections of embryonic (spindle) cells; in the lymph-glands, no malignant feature.

Patient in good health, and free from any re-appearance; when last seen (in October, 1889).

Case II

Breast-cyst apparently of 14 years' duration. Sudden increase after injury, 2 months previously. Cyst excised; and found to contain vegetations of recent origin. Walls of cyst composed of very embryonic (? incipiently cancerous) fibrous tissue.

Mary H. aged 44. Married; 8 children; baby 4 months old, not nursed. Admitted into the Cancer Hospital, December 10, 1888.

Family history.—Father had cancer of lip. Mother died of cancer of the rectum. Sister died of breast-cancer.

Causation.—Fall 2 months previously, striking just above the breast. Also some recent mental trouble.

Duration.—14 years; noticeable increase 3 weeks.

History and present state.—A strongly-built healthy-looking woman; husband a schoolmaster in Wales. Abscess of breast 14 years ago; since then, 'always a hardness.' No pain or increase in size prior to injury, 2 months ago; for past 3 weeks, much pain, and rapid enlargement.

Towards the outer side of the left breast, a large globular elastic fluctuating tumour (about the size of a large orange), freely movable. No enlarged glands. Nipple retracted; but has always been so.

On excision, a single cyst, containing a blackish fluid, and presenting also some very small vegetations, was encountered. The thick walls of the cyst were found to be composed of very embryonic fibrous tissue (spindle cells with relatively large nuclei);—they were therefore regarded as in an incipiently sarcomatous stage. At one point, a pigmented induration was present; which was carefully examined for scirrhous deposit,—but with negative results.

The patient was well, when last seen in September 1889.

Case III

Encephaloid (acute scirrhous), disease of left breast. Tumour apparently of 21 years' duration. Rapid increase, and appearance of cancerous features after sudden death of husband. Two operations quickly followed by 'recurrence.'

Martha P. aged 46. Widow; 3 children. Admitted into the Cancer Hospital, March 1, 1886.

Family history.—Nil.

Duration.—Tumour 21 years; increase 8 years. Since then, 2 operations and 'recurrence.'

Causation.—No injury. Much trouble; malignancy began after sudden death of husband 8 years ago.

History and present state.—First felt a 'lump' in the breast after birth of first child, now aged 21 years. This continued about the size of a hazel-nut until 8 years ago, when great shock by sudden death of husband. Patient noticed an enlargement 'as soon as she was getting over her trouble;' had then to turn out and earn her living as cook. Now rapid growth; is sure tumours were identical. Operation in three weeks at Homœopathic Hospital; a 'recurrence' as soon as wound healed, and in 6 weeks, a second operation. Disease re-appeared nine weeks after the latter.

A very puckered cicatrix; whole of breast tissue has been removed. In centre of scar, a prominent livid ulcerated tumour, with hard base. Beyond the reach of operative treatment; to attend as out-patient. (The fungous growth had already existed 3 years.)

Case IV

Tumour of 8 or 9 years' duration (probably cyst or cystic fibroma) assuming malignancy, and undergoing rapid increase after death of husband. Excision. Found composed of multiple cysts, with small scirrhous deposit.

Elizabeth W. aged 56. Admitted into the Cancer Hospital, August 24, 1883.

Family history of cancer.—Nil.

Causation.—No injury. Always much trouble and hard work. Husband died 3 months previously; had nursed him through a five-months' illness, and had sat up much at night.

Duration.—Eight or nine years; increase, 3 months.

History, &c.—A small tumour had existed for 8 or 9 years; and the nipple had been retracted 4 or 5. No pain or inconvenience till death of husband; since then a progressive increase.

Breast as large as two fists, rounded, prominent; over the greater part, indistinct fluctuation; the base generally hard; nipple retracted completely,—from its site protrudes fluctuating tumour 1 inch in diameter. Skin over this reddened. No enlargement of axillary glands perceptible; and humerus unaffected. Occasional lancinating pain; patient a pale grey-haired rather stout woman.

Excision of breast and of axillary contents, August 31, 1883. Tumour mainly composed of cysts, containing a dark-green fluid; when this had been evacuated, a soft ashy-grey material (apparently altered blood-clot), found lying loose in the loculi. The inter-cystic material

generally, fibrous ; at one point, was 'gritty' on section, and presented the typical features of scirrhus (yellowish-white puncta in a hard quasi-gelatinous base). One axillary lymph-gland as large as a horse-bean.

The patient was subsequently lost sight of.

Case V

Scirrho-Cystic Breast Tumour of 5 *years' duration ; increase noticeable for* 4 *months only.*

Annie B. aged 30. Married. Two children. Admitted into Cancer Hospital, July 3, 1884.

F. H.—Father's mother died of tumour in left breast. No other cancerous relative.

Duration.—About 5 years ; increase 4 months.

Causation.—No injury ; hard work ; some recent mental trouble (particulars not ascertained).

History and present state.—Tumour has existed 5 years ; became painful and began to increase 4 months ago.

Nipple retracted ; continual discharge of serous fluid. Deep in substance of left breast, a hard tumour, freely movable. In the axilla, several glands as large as hazel-nuts.

Excision of breast, and of axillary contents July 8, 1884. Tumour proved to be scirrhus, in parts softening ; much fibrous tissue under nipple,—(but no cyst-wall to be clearly made out, owing to advanced 'liquefactive degeneration').

Case VI

Tumour of 5 *years' duration ; noticeable increase for* 1 *year. Tentative treatment by puncture with trocar. Subsequent excision, with ultimately unfavourable result.*

Mary J. aged 51. Married. Admitted into Cancer Hospital, April 3, 1884. Nine children.

Family history of cancer.—Nil.

Duration.—Five years.

Causation.—No injury. No mental trouble. Large family. Hard work as laundress.

History of present state.—Has felt tumour for past 5 years ; but no inconvenience or increase in size till past year.

Now in left breast, towards outer side, a fluctuating tumour, freely movable, of size of large walnut. In both axillæ, lymph-glands somewhat above the normal size ; but larger on the left ; no marked increase in bulk.

On April 29, puncture with trocar. About 2½ ounces of straw-coloured fluid evacuated ; complete collapse of cyst ; and no solid base felt subsequently.

Speedy re-filling ; increased axillary enlargement ; induration around base of cyst ; and slight retraction of nipple. On June 10, the breast and axillary contents were removed ; the breast tumour proved to be scirrhus, with extensive deposit in the lymph-glands, softening and breaking-down. The patient was discharged apparently well on July 19 ; but rapid re-appearance ensued.[1]

Case VII

Breast-cyst of 5 years' duration with small scirrhous growth in wall.

Amelia R. aged 36. Single. No family history of cancer. No njury. Much trouble. Tumour noticed 5 years ; size of large apple, at upper part of left breast. On removal, proved to be a congeries of cysts filled with brown serum ; at one spot, a scirrhous deposit hardly larger than a sixpenny-piece, in the cyst-wall.

Case VIII

Scirrhus in Breast-tumour of 42 years' duration.

Jane H. aged 66. No family history of cancer. Noticed tumour in left breast at age of 24 ; of the size of a 'nut ;' was movable. This began to increase in size 3 years ago ; is sure that the tumours are identical. Now the whole mamma infiltrated with scirrhus ; large hard mass of lymph-glands in the axilla ; and some above the clavicle. (Seen as out-patient at the Cancer Hospital, March 6, 1879. Notes as above ; but history incomplete.)

[1] It is very unfortunate that the apparently purely cystic character of the tumour in this case ; together with the slight degree of lymph-gland enlargement observable ; led to hesitation in performing a radical extirpation. So far as the pathological phenomena are concerned, the duration of the primary growth ; and the small amount of lymph-gland deposit present, when the patient first came under observation ; make it tolerably certain that the cyst had existed some years before the cirrhous deposit.

Case IX

Parotid Tumour of 20 years' duration; recent increase; development into a 'Malignant Adenoma.'

Isabella K. Married. 8 children. No family history of cancer. Admitted into Cancer Hospital, November 7, 1887. Below the right ear, a round fluctuating tumour, freely movable; of size of small orange. Has existed more than 20 years; has only lately enlarged and become painful. No lymph-glands affected; general health good.

Upon removal, the growth found to be mainly solid; a soft pulpy greyish gelatinous base; one small cyst within this.

Result of microscopical examination: 'Exaggerated parotid structure.' Large cells in acini of various sizes; sometimes 1 cell in a single pocket of fibrous tissue; of typical 'alveolar sarcoma' structure; bands of the trabeculæ varying in thickness. In the cells, relatively large nuclei.

Patient subsequently recovered with a parotid fistula; which soon healed without trouble. Remains well to present date (December, 1889).[1]

[1] The writer is much indebted to Drs. O'Reilly and Bell, Resident Medical Officers at the Cancer Hospital, for kind assistance in transcribing the notes of these and of other cases here reported.

APPENDIX C.

THESE two cases appear to illustrate the occasional occurrence of mixed pathological processes :—the secondary supervention of cancer in an originally non-malignant *solid* connective-tissue neoplasm developed in the mamma.

CASE I.

Cystic fibroma of left breast; of uncertain duration,—noticeable increase for past 2 years. Excision of mamma. Microscopic appearances negative of malignancy. Speedy re-appearance in the form of scirrhus; and death with extensive secondary deposits.

Sarah K. aged 64. Married. One child. Admitted into Cancer Hospital, February 22, 1887.

Duration (apparent) of tumour, 2 years.

Family history.—Father died of cancer of eyelid. No other cancerous relatives.

Causation.—No injury ; no history of muscular strain. Much trouble for past 6 years. Had abscess after birth of child 21 years ago ; ever since a small 'kernel.' Doctor at confinement said this might become cancer. Has dreaded cancer ever since.

Present state.—Fairly healthy general appearance. In upper part of left breast, a tumour as large as a small orange, freely movable ; in centre of this, a projecting boss which fluctuates. No retraction of nipple or adhesion of skin. Slight tenderness under edge of pectoralis ; no glandular enlargement however to be felt.

Breast excised February 25, 1887 ; contents of axilla not interfered with. The tumour proved to be a cyst in the midst of firm white fibrous tissue ; no intra-cystic vegetations ; and no indications to the naked eye, of malignancy in any shape. The microscopic appearances corresponded very closely to the engraving of adeno-fibroma, in Dr. Green's well-known 'Manual of Pathology,' fifth edition, p. 160 ; small cysts filled with epithelioid cell-growth, scattered through a thick basic structure of well-organised white fibrous tissue. The only slightly suspicious feature was that, here and there, some of the intra-cystic cells appeared somewhat to en-

croach upon the enveloping solid framework of the neoplasm. Nothing in the least approaching the features of scirrhus on the one hand, or of spindle-sarcoma on the other ; could be detected on careful examination, either by Dr. A. C. Dove (Pathologist to the Cancer Hospital) ; or by the writer.

Some sphacelus of the skin-flaps retarded recovery ; but the patient was eventually discharged well, and without any cancerous indication, on July 30, 1887.

March 26, 1888. Re-admission with extensive livid cancerous (scirrhous) deposit in and about cicatrix. Very harsh clanging cough ; evidences of deposit in left lung (areas of consolidation) ; left hydrothorax ; probable deposit in mediastinal glands. Glandular enlargement in left axilla and above clavicle. Rapid downward progress, and death on April 24, 1888. The post-mortem examination shewed extensive cicatricial, axillary, and intra-thoracic deposits ; a microscopic examination of the first revealed typical scirrhous acini, embedded in the fibrous tissue.

Case II.

Cystic Fibroma. Thin section of growth presenting microscopic indications of incipient malignancy.

Ellen C. aged 42. Married. One child (dead). Admitted into Cancer Hospital, October 29, 1888.

Family history.—Nil.

Duration.—Six months.

Causation.—No injury. Boy born 2 years since ; nursed him till 7 months ago, when he died. Also trouble with husband.

History and present state.—Tumour noticed about a month after death of child as above. Patient has careworn appearance. Breasts small. Hard nodular growth, implicating whole tissue of mamma. Nipple not retracted ; tumour freely movable. Discharge of sanguineous fluid from nipple. Gland deep in axilla slightly enlarged.

Excision of mamma and of axillary contents November 3, 1888. Solid fibrous-looking material, enclosing many small cysts ; latter contained a blackish fluid. Many axillary glands slightly enlarged ; nothing found in these by microscope. A thin section of the primary growth presented the characters of cystic fibroma over the greater part of its extent ; but a minute area evinced the typical microscopic appearances of scirrhus. No re-appearance to present time, December 1889.

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