The Pathological Changes affecting the Endometrium: A Contribution towards their Classification.*

By ELIZABETH H. B. MACDONALD, M.A., M.D., Ch.B.,

Carnegie Research Scholar (1905—7),

*Assistant to the Professor of Midwifery and Gynæcology, University
College, Dundee.*

CURETTING of the uterine cavity is carried out for such a variety of causes that the examination of any large number of scrapings, taken miscellaneously, throws much interesting light on the manifold changes, physiological and pathological, to which the endometrium is subject. A mere description of these changes is not an easy task; their interpretation from a clinical standpoint is still more difficult. Much careful and fundamental work has been done in this direction, but it seems that there is still need for a simple and yet scientific classification of the various forms of change, that will serve equally for the clinician and the histologist. With the hope of helping in this direction, I have examined the material obtained by curettage of the uterine cavity in over 200 cases, in most of which I have investigated also the clinical histories, and as far as possible the results of the treatment received. In addition to this, I have examined the endometrium in 25 uteri removed for such conditions as cancer of the cervix, fibromyoma, prolapse, "chronic metritis," etc., and, for purposes of comparison, in the uterus of the newly born, and in several presumably normal adult uteri. The inclusion also of one case of chorionepithelioma, one of tuberculous disease of the endometrium, one of sarcoma, and five of cancer of the body of the uterus, has given me a very complete representation of the recognized pathological affections of the endometrium.

The question of malignancy must always be of primary importance in the diagnosis of uterine curettings. There is something simple, and to a certain extent satisfactory, in the classification of all scrapings into the two great groups, "malignant" and "non-malignant," with a third group of borderland cases conveniently labelled "suspicious." But there is something decidedly unsatisfactory and unscientific in the arbitrary designation of all the "non-malignant" cases as "endometritis," even when the term is qualified by the prefixing of such adjectives as "glandular," "interstitial,"

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"fungoid," "polypoid," etc. Not that the varieties so designated do not exist, but that the names convey little meaning from a histological point of view, while from a clinical standpoint they are worse than meaningless. It is no explanation of a severe uterine hæmorrhage to say that the patient is suffering from a "polypoid endometritis," while to describe a "hæmorrhagic endometritis" is manifestly absurd and misleading. In the great majority of these cases there is no endometritis. With the same disregard for accuracy, cases that are not cured by a single curetting, and that show no striking characteristics on microscopic examination, are labelled "chronic endometritis." Great confusion has arisen from the abuse of this term, and more recently, with the tendency to look on the endometrial changes as secondary and subsidiary to changes in the deeper tissues of the uterus, an equal confusion has arisen from the indiscriminate use of the term "chronic metritis" to designate these deeper changes. This latter term, so far as can be gathered from the literature on the subject, has been applied equally to chronic inflammatory conditions resulting definitely from infection, and to conditions arising where there was no evidence, or even possibility, of an infective origin. The relation of endometrial changes to changes in the deeper tissues clearly requires investigation. When is the endometrium primarily at fault? When does it play merely a passive part? Can the active changes be distinguished microscopically from the merely passive? These are questions that still remain unanswered.

To the general descriptions of the pathological changes in the endometrium I have nothing new to add. But one or two points I should like to emphasize.

In the first place, it is quite clear that there are marked individual variations in the uterine mucosa; that in some cases, for instance, an exceedingly scanty stroma is physiological, in others a densely cellular stroma. Therefore, to regard all departures from a single normal type as pathological is to fall into serious error. In this connexion it is interesting to note, too, that in some cases a curetting alters the general appearance of the mucosa in such a way that the material obtained at a second curetting bears no particular resemblance to that previously obtained; and again, a second scraping may be so characteristic in its merely physiological aspects as to immediately recall the first.

In the second place, it must never be forgotten that a consideration of the period of the menstrual cycle at which the curetting was made will explain many otherwise puzzling variations. The failure to recognize physiological premenstrual swelling and congestion has been the cause of much ambiguity and error. These normal premenstrual changes have been very generally described as "hypertrophic" and "hyperplastic glandular endometritis," while further

ingenious subdivisions have been devised to explain other trifling physiological variations.

In the third place, no perfectly sharp distinction can be drawn between simple and malignant growth in the endometrium, or indeed, in any other tissue. There is an essential similarity between the two. Any tissue that gives rise to simple adenoma *may* give rise to malignant adenoma, and it may be impossible to say where the one merges into the other. So a scraping from the uterus of a patient at the cancer age may show characters suspicious, but not conclusive, of malignancy, and the subsequent history be perfectly satisfactory; in such a case, in spite of the most painstaking histological examination, it may remain impossible to say whether a very early malignant condition has been cured by the curetting, or whether the condition is really simple. It may well be that a malignant condition far enough advanced to be diagnosed with certainty is already too far advanced for successful treatment save by the most radical means.

Putting aside definitely malignant as well as merely physiological changes, and disregarding also obviously septic cases in which the clinical history alone was sufficient for diagnosis, I have endeavoured to classify the large and confusing mass of "non-malignant" cases in a simple and natural way.

I. There is a very well-defined group in which the changes arise from the *retention of fetal or decidual remnants*. Some of these cases are obvious. Hæmorrhage dating from an abortion and cured by curetting is sufficiently diagnostic even in the absence of definite remnants in the tissue examined. Others are less easily recognized. The history is not clear, and the diagnosis depends on the microscopic examination. The recognition of chorionic villi or patches of decidual cells is of course conclusive. But in cases in which the hæmorrhage has gone on for some weeks, or perhaps recurred at intervals, the retained tissue may be greatly altered and require a rather careful search. Even where no definite remnants are found, it is possible, in many cases, to say with a fair degree of certainty how the condition has arisen. It is noticeable that in many cases where curetting is done for hæmorrhage continuing after abortion, some muscular tissue appears in the sections. Obviously the softened muscular tissue is brought away by the curette more readily than in ordinary circumstances. The vessels in this muscular tissue, and to a less extent in the mucosa itself, show interesting physiological changes worthy of further study. The presence of such muscular tissue and vessels, along with the signs of active regeneration in some parts of the mucosa and the suggestion in the deeper parts of a mechanical force drawing the glands and blood spaces into curious, irregular outlines, make up a fairly characteristic appearance. Often with such an appearance in the greater part of a

section, a small patch of altered decidua will be found in the stroma, with reactionary inflammation in the surrounding tissue. Naturally the removal by the curette of the remnants causing the irritation in these cases is the simple and certain cure of the condition. Alongside of this well-defined group, into which 20 per cent. of the cases examined by me fall, it is interesting to place as the malignant counterpart the condition known as chorioneplithelioma.

II. The second group which I shall attempt to define is one designed to include *all those cases of endometrial change which have an infective origin.*

No difficulty arises in cases of recent infection, whether puerperal or gonorrhœal (the two by far most common varieties) where there is evidence from the history of recent infection, and microscopic evidence of an active inflammatory condition. The process here is exactly similar to acute inflammation occurring in any tissue, and microscopic diagnosis is rarely called for.

It is when we come to the remote effects of infection on the endometrium that the difficulty and confusion arise.

It is surprising, considering the chances of infection, how rarely evidence of active inflammation is found in uterine scrapings. At the same time, the number of patients who date their troubles from a confinement or miscarriage, is striking. In the specimens at my disposal it was found that, from the microscopic examination alone, without regard to, or indeed knowledge of, the clinical histories, it was possible to group together a certain number as having undergone essentially similar pathological changes in spite of wide variations in non-essential respects. In every case in the histological group so formed, a more or less definite history of infection was elicited on inquiry. The repeated and invariable occurrence of these pathological features in cases giving a history of infection justifies in my opinion the conclusion that the pathological condition is a result of the infection. By placing the pathological picture alongside of the clinical history, a definite group is formed, to which the title "chronic infective endometritis" may be correctly applied. This title is clearer and more definite, and conveys more meaning than the much abused term "chronic endometritis," which would be a quite correct and sufficient title were it not for the confusion that has arisen from its application to conditions which are not, and never have been, truly inflammatory in their nature. It has become necessary to emphasize the truly inflammatory nature of these cases by the introduction of the term "infective." The question as to whether there may not be an inflammatory process independent of infection need not be discussed; at least the ground is cleared of many ambiguities by assuming that all inflammatory processes in the endometrium, apart from the reactionary inflammation due to the

presence of a foreign body, have an infective origin; and such processes so arising are correctly described as "chronic infective endometritis." Further, if confusion is to be avoided, the term "chronic endometritis" as applied to non-infective and non-inflammatory chronic pathological conditions in the endometrium must be discarded.

This group of chronic infective cases is not a large one. Not more than 15 per cent. of my specimens could be diagnosed as belonging to it. The essential features to be taken into account in the diagnosis are:—(1) The origin. (2) The symptoms. (3) The histological picture. (4) The effect of curetting. With each of these I shall deal shortly.

1. The symptoms often date from a confinement or miscarriage, and careful investigation will usually elicit the fact that convalescence from the confinement in question did not run a perfectly straightforward course, even although there were no alarming indications of septic infection. It is probable that a mild degree of infection occurs in many cases, and is responsible for a long list of uterine troubles with symptoms extending over a long period of years. In patients who are sterile, and date their symptoms from marriage, the possibility of gonorrhœal infection must never be overlooked.

2. Usually the three cardinal symptoms of uterine trouble are complained of, viz.: pain, leucorrhœa or purulent discharge, and hæmorrhage in the form of menorrhagia. The menorrhagia is the least constant of the three, and menstrual pain perhaps the most invariable and troublesome. There may be no excessive hæmorrhage in cases where the menstrual pain is such as completely to incapacitate the patient. It appears as if the more chronic, and less virulent, cases, where thickening of the mucosa is more marked, are characterized more by pain than by menorrhagia. Leucorrhœa or purulent discharge is almost invariably present to some extent and may be very profuse.

3. The histological features show great variation according to the degree, nature, and remoteness of the infection.

In more recent cases, particularly if they have been somewhat acute at the onset, there are unmistakable evidences of an inflammatory process in the stroma. The glands are not necessarily increased in number, but may be remarkable from their irregularity of outline, the result of pressure in the surrounding stroma. The stroma may show numerous inflammatory foci. A collection of leucocytes in the stroma is not necessarily a sign of inflammatory mischief; often a definitely circumscribed collection appears in the midst of an apparently normal stroma, and must be regarded as physiological. The inflammatory collections are more diffuse, and characterized by the evident destruction of tissue which they cause. Later on the inflammation subsides, leaving the stroma with the evidence of old

inflammation in the form of strands and whorls of long spindle-shaped cells pressing and pulling on the glands.

But the cases that give rise to difficulty are those that have been mild from the start, and have run a very slow and chronic course. It is these cases which furnish the characteristic histological picture already referred to, of which the following are the main features:—

The mucous membrane is greatly thickened, measuring from 3 to as much as 10 mm. in depth, whereas the average normal depth probably does not exceed 2 mm.

The *glands* naturally in such a thick mucosa are greatly increased in number, but the proportion of gland to stroma tissue is not perceptibly altered. The glands are of a more or less corkscrew outline, but do not as a rule contain any involved or complicated invaginations. The epithelium is nearly always affected by what has been termed “mucoid degeneration”; in some cases this is extreme, the epithelial cells being converted into clear, colourless cells of a hazy globular outline, with very pale, round, vesicular nuclei, lying near the centres of the cells, the gland spaces at the same time containing some mucoid material. “Mucoid degeneration” is not peculiar to infective cases, but I have found it in no others to the same marked degree. A peculiar feature in connexion with it, in some cases very striking, is the varying staining power of the epithelium. Side by side with a gland lined by epithelium in an advanced stage of degeneration, with almost colourless nuclei and indistinct cell outlines, may be seen a gland whose epithelium is regular and well-marked, with dark nuclei regularly disposed at the bases of the cells. The only possible explanation of the appearance is that in the latter gland the degenerated epithelium has been shed (probably during a menstrual period) and its place taken by young, healthy epithelium.

The *stroma* shows characteristic changes. It is of very irregular density. For the most part the cells appear isolated from each other, irregularly enlarged, approaching the decidual type of cell, and there are dense patches surrounding the thick-walled capillaries. In some cases it is only where the stroma is condensed around the groups of small capillaries and “arterioles” that its component cells appear to have any continuity with each other. Often a similarly dense formation may be observed in the stroma surrounding a gland, appearing to compress it, and giving it an irregular, somewhat crenulated outline distinct from the easy wavy outline of the mass of glands. Similarly under the surface epithelium the stroma may show an unusual continuity. The dense patches suggest new formation of stroma. A good many leucocytes of the small, round, darkly-staining and polymorphonuclear varieties, are to be seen throughout the stroma or within the gland cavities, and not unfrequently circumscribed collections of

leucocytes may be observed in the deeper parts of the mucosa. In very many cases, areas of hæmorrhage of more or less recent date, causing destruction of both gland and stroma tissue, are seen.

The *capillaries* often show a curious degeneration in their walls, the exact nature of which it is difficult to determine. They have a distinct lining which looks degenerated, and stains red with eosine, and this may be noted both in the large thin-walled and the small thick-walled capillaries. Whether the change is of the same nature as the well-marked "hyaline" or "colloid" degeneration seen in the thickened arterioles and thick capillaries in association with a similar condition of the deeper arteries, I am unable to say. Gardner and Goodall have described two forms of vascular change in the uterus, one of the nature of a deposit occurring in infective cases, and the other a true arterio-sclerosis. The change noted here may belong to the former class.

These are the general characteristics of the mucosa in a number of cases. The whole picture suggests a chronic irritation of the stroma. I was fortunate enough to secure a uterus showing this condition in a case where the organ was removed on the suspicion of a small interstitial fibromyoma being the cause of the severe menstrual pain complained of. The mucous membrane was 7—9 mm. thick, showed these characteristic changes, and showed in addition an unusual penetration of the glands into the underlying muscular tissue, and of embryonic cells between the muscular bundles. The uterus was generally enlarged. This at once raises the question of the relation of "chronic endometritis" to "chronic metritis." In this case at least there was little doubt that the primary trouble was a chronic infective endometritis, and that the process was extending to the deeper tissues of the uterine wall.

4. The effect of curetting on these cases of chronic infective endometritis varies according to the extent and nature of the infection. Rarely are they cured by curetting, although in most cases amelioration of the symptoms for a varying length of time results. The mild cases of puerperal infection, where the most marked degree of thickening of the mucosa occurs, *may* be cured by a single curetting. The symptoms disappear, the uterine cavity shrinks to a normal size, and a permanent cure results. More usually the symptoms recur after a few months' interval, leaving one to infer, in the absence of adnexal involvement, that the infective process has been restarted from the remaining deep gland ends, or that it has already penetrated into the muscular tissue. In a good many cases, more especially those of gonorrhœal origin, thickening of one or both tubes may be already palpable at the time of observation, and nothing is more certain than that a re-infection of the uterine cavity will take place after curetting. It is not unusual to find thickening in the tubes or broad ligaments on a patient's return perhaps a year or two

after curetting, in cases where no involvement was palpable when the curetting was performed.

It would be easy to subdivide this group of chronic infective cases according to the probable infective origin, but such subdivision has been purposely avoided. The main point is that they should all be recognized as infective cases, and that the recognition should extend beyond cases where the microscopic evidence of inflammation is unmistakable to those where the pathological appearances must be placed alongside of the clinical history before the diagnosis is complete. Not in all cases where the symptoms date definitely from a confinement is the appearance which has been described found. The trouble in many cases may be a muscular insufficiency, or subinvolution quite independent of infection.

In this class of chronic infective endometritis must be placed also the one case of tuberculous disease of the endometrium, which was among my specimens. The endometrium in this case was secondarily infected from the tubes, and the disease was not far advanced, the greater portion of the endometrium removed by curette showing merely a thickening of the tissue, with signs of chronic irritation in the stroma. The surface epithelium was as yet intact. In one portion, typical tubercles appeared in the stroma, with large central giant cells, and the usual epithelioid and small round cells forming circumscribed areas of destructive change.

III. The third group is designed to include all those *cases in which the pathological changes in the endometrium must be regarded as secondary to some deeper uterine, adnexal, or general condition.*

These cases form rather more than 50 per cent. of the whole, and represent an extraordinary variety of pathological changes. It must be at once frankly recognized that any and every variety of change, in glands, epithelium, or stroma, may occur as a secondary manifestation. Any chronic irritation may stimulate the endometrium, a proverbially unstable tissue, subject to unique physiological variations, to a simple glandular or stroma proliferation. Great glandular increase has been noted as occurring in chronic infective cases; it is commonly observed in association with fibromyomatous growth, with cancer of the cervix, or with any other condition that might act as a source of chronic irritation. Similarly, the cells of the stroma respond to the stimulation by becoming enlarged and altering their shape until they approach the decidual cell in type. Löfqvist, in his exhaustive work on the subject, comes to the conclusion that all the commonly observed changes in the endometrium may be regarded as the response of the tissue to stimulation, and he describes the changes as varying degrees of "decidual reaction." The conclusions of Van Meerdervoort are somewhat similar. He suggests "chronic oedema" as a general term to include practically all varieties of change in glands or stroma, suggesting at the same time by this title that all

the changes are due to one general simple cause, and that the marked variations which have been laboriously described are mainly physiological changes superimposed on a mucosa already the seat of "chronic oedema." One important result of their work has been to direct attention away from the merely accidental variations in the mucosa to the fundamental principles underlying all the forms of change.

Amongst the confusing variety of secondary changes, three more or less definite classes can, I think, be recognized.

1. In one class there are appearances of a fairly constant character, which may be designated as "*chronic oedema*" of the mucosa. There is a general hyperplasia of the tissue. The glands are not notably increased in number relatively to the amount of stroma, but they appear larger than normal, the epithelium being deep and the individual cells swollen. A similar change affects the cells of the stroma, which are large, oedematous and often closely packed, and which stain rather lightly. This condition is found typically in those frequent cases where curetting is performed for hæmorrhage in women near the menopause. Usually then the capillaries, especially those just under the surface epithelium, are large and more or less dilated; the "arterioles" may be thickened, but frequently are unaffected. Often there is polypoid formation. This is the condition often named "polypoid endometritis." Similar changes may occur at any age. One of the cases observed was that of an unmarried anæmic girl of 21, with menorrhagia and metrorrhagia since the onset of menstruation at 14. Repeated curetting, with rest in bed and all the usual remedies for anæmia, has so far failed to lessen the menorrhagia. The uterine wall is thin and soft, does not respond to the stimulation of the curette, and the mucosa removed on the occasion of the last curetting was thick and succulent, and showed the condition described. The cause of the trouble is obviously lack of tone in the musculature, including the muscular coat of the vessels, and it is easy to see how this will lead to increased menstrual loss, and secondarily to general hyperplasia of the endometrium. In the cases of hæmorrhage at the menopause, the cause is very probably similar, viz., muscular failure from climacteric changes.

An essentially similar condition is found in the mucosa of the uterine body in many cases of cancer of the cervix. The mucosa in two of such cases measured 3—5 mm., and showed this general hyperplasia, with some degree of mucoid change in the glands, and a very densely cellular stroma. It has been noted also in the endometrium of uteri removed for prolapse, and in a uterus removed for hypertrophy of the cervix, though in this case the glands were also uniformly cystic. Almost invariably where this condition has been found in scrapings, the symptom calling for treatment has been hæmorrhage, associated with a feeling of weakness. Probably we

are justified in considering these changes as specially associated with muscular insufficiency.

2. A second class shows changes which appear to result from a condition of *chronic venous congestion*. The mucosa is thickened, often to a marked extent, and there are evidences of continued pressure in the stroma. The glands may appear small, in a loose stroma the meshes of which are filled by exudation, serous or hæmorrhagic, which presses the stroma cells far apart. The thin-walled capillaries may be enormously distended, and in one well-marked case the pressure appeared to have extended back from the thin-walled to the thick-walled capillaries, which were distended and globular in outline. This is quite unusual. The whole appearance suggests a mucosa kept throughout a long period in the state of congestion which is physiological before the onset of menstruation. In long-standing cases the stroma becomes altered, and presents the appearance of a fibrinous network over which are dotted small, dark, round cells, and the capillaries appear to have definite fibrinous walls. The condition may arise from over-stimulation of the sexual organs where the muscular tone is good. It has been found in cases of marked retroflexion in virgins, and in young married nulliparæ complaining of painful menstruation or menorrhagia with pain since marriage.

3. In a third class the vascular changes predominate. There is an *increased vascular supply*. A certain number of specimens have a striking sponge-like texture which is found to be due to the enormously increased number of arterioles and capillaries, all in a more or less irregularly distended condition. The blood spaces appear as numerous and as striking as the glands. Usually in these cases the arterioles are found to be thickened, but not invariably so. The condition has been noted, along with general cystic dilatation of the glands, in several cases of fibromyoma of the uterus, as well as in a considerable number of scrapings where the change could only be vaguely attributed to some deeper circulatory disturbance. Theoretically, any cause leading to an increased vascular supply to the uterus might be responsible for this condition in the mucosa.

I have been unable to fit the specimens showing typical vascular thickening and degeneration into any definite group. Sometimes the changes appear well-marked in a scraping from a senile case, and the temptation is strong to regard them as true arterio-sclerosis; again, an almost precisely similar condition is found in the mucosa from a young primipara. In some of these cases the appearances are undoubtedly physiological, the result of recent pregnancy, but there seems to be a very wide variation in the physiological changes in different individuals.

"Hyaline" or "colloid" degeneration of the endometrial capillaries was noted in a considerable number of cases.

There are other more obvious forms of secondary change in the

endometrium. Thus the thinning of the mucosa and its invasion by fibrous tissue formation, in senile cases; or the mechanical thinning from pressure in the case of large tumours, scarcely require mention here.

The effect of curetting in cases where the mucosal changes are secondary is very variable and very interesting. Temporary benefit at least usually ensues, since the substitution of a new healthy mucosa for the thickened and congested tissue removed gives relief for a time even in cases where the unhealthy conditions are gradually reproduced. Cure may follow a single curetting. In a certain number of cases, particularly in young married women curetted for painful menorrhagia, pregnancy follows the curetting, and naturally a complete cure. Apart from this contingency, it must be remembered that scraping the uterus is a powerful stimulus to the uterine muscle, and in cases where the trouble has arisen presumably from an atonic muscular insufficiency, this stimulation with its resulting hyperæmia, along with rest and the general tonic treatment usually adopted in these cases, may very probably effect a cure. And it must not be supposed that such cure will follow the adoption of general and local tonic treatment *without* the removal of the thickened mucosa. The endometrium has become unhealthy, with leaky capillaries and a congested stroma, and its removal is a necessary part of the treatment even where its changes are admittedly passive.

Some patients experience no relief whatever from curetting, and a small number, generally among the subjects of climacteric hæmorrhage, are made worse. Hæmorrhage, even demanding hysterectomy, may be induced by curetting a uterus where imperfect contraction of the hard sclerosed walls cannot close the inelastic gaping arteries, and where the endometrium was really acting as a check on the hæmorrhage.

IV. The fourth and last group is designed to include all cases of *new growth* in the endometrium. Apart from malignant growths and actual simple tumour formation, I include under this heading all those cases of marked glandular hypertrophy and of overgrowth in the stroma, which it is mere assumption to ascribe to some source of chronic stimulation. We can no more explain the glandular overgrowth in these cases than we can explain the occurrence of malignant new growth. Perhaps with fuller knowledge of the secondary or passive changes in the endometrium many cases now necessarily regarded as primary will be found to belong properly to the group of secondary changes. The reasons for putting them at present into this fourth group are largely theoretical, and rest chiefly on the lack of evidence of any primary muscular, circulatory, or adnexal disturbance, and on the relation of the changes noted to the common forms of malignant change in the mucosa. Certainly, so far as I

know, no adequate explanation has yet been offered for such glandular overgrowth of the uterine mucosa as that to which the term "simple adenoma" has been applied.

1. This name of "*simple adenoma*," though not free from objection, is sufficiently accurate and unambiguous to be acceptable. The condition so designated is a simple multiplication of the glands, whose epithelium retains its very distinct one-layered appearance, with perfectly regular, very darkly-staining nuclei disposed at the bases of the cells, the "basement membrane" layer of fusiform cells remaining very distinctly marked, and the glands lying often in such close proximity as to appear to be merely held together by the scanty stroma. The invaginations of the gland epithelium may be very greatly involved. The process may be localized, and a definite tumour formed which projects into the uterine cavity. This gives the "papilloma," which is rare, but has been described in old people. From the simple adenoma it seems but a step to the malignant adenoma. The branching of the glands becomes atypical and irregular, and this proliferation may be malignant in character before any unmistakably malignant changes can be detected in the epithelium, and while the limiting layer of fusiform cells is yet intact. Malignant growth of the endometrium of this type retains its glandular arrangement in a surprising way for a long time—as long as three years in a case under observation, where hysterectomy was performed three years after the condition of malignant adenoma had been diagnosed from a curetting.

2. There is another form of glandular overgrowth which must be noted. In this the number of glands is greatly increased, and the epithelium tends to grow out into tufts and papillæ. There may be polypoid formation. MacGregor has described this as the "*papillary*" type of *glandular hyperplasia*. Van Meerdervoort would place these cases in the group of secondary changes: he attributes the papillary invaginations and tuft formation to a shrinking of the stroma in the post-menstrual period—a merely mechanical effect becoming more marked in cases of chronic congestion where there is more than the usual destruction of stroma tissue at the menstrual period, and consequently more than the usual shrinking. But the chief point of interest here again is the relation of this condition to the malignant epithelial proliferation into which it almost imperceptibly merges. If we imagine the little outgrowths becoming solid, the epithelial cells assuming an active character, becoming many-layered, and invading the stroma, we have the second and common type of adenocarcinoma of the endometrium. Advanced mucoid degeneration in an overgrown mucosa may closely simulate a malignant condition, since the epithelium often appears many-layered, the cells are more rounded than they are normally, and the nuclei lose their staining power. The varying staining power of

neighbouring glands, already remarked on, heightens the suspicious appearance.

3. Mention must be made also of those cases where the *stroma* appears to be the seat of an active growth. Without any signs of an inflammatory process, the stroma appears in some cases densely cellular, with strands of long spindle-shaped cells running in various directions throughout it, the glands meanwhile becoming compressed and assuming a stellate outline, or appearing to be actually reduced in number and size from the overgrowth of the stroma. Again the malignant counterpart is found when the new growth in the stroma actually invades and destroys the glands, becomes very vascular, and assumes the ordinary characteristics of a sarcoma.

The general conclusions arising from the present investigation, therefore, are that the endometrium is to be regarded as an unstable tissue, subject to great physiological variation, readily affected by disorders of neighbouring tissues, readily responsive to stimulation, but only rarely the seat of primary disease. Malignant disease of the body of the uterus is comparatively rare; simple tumour formation is uncommon; chronic infective endometritis is commoner than these, but still not common by comparison with the number of other conditions for which curetting is practised. In the great majority of the cases in which the uterus is scraped, the endometrium has played a merely passive part in the pathological changes, although its removal may be a justifiable and even necessary part of the treatment.

In the classification here adopted I have tried to avoid merely symptomatic or merely histological subdivisions, to disregard histological changes to which, so far as our present knowledge goes, no clinical significance attaches, and to indicate merely certain broad groups of endometrial change.

The classification indicated may be tabulated and amplified thus:—

I. Conditions arising from decidual and fœtal retention.

Simple.		Malignant.
Simple inflammatory reaction.		Chorionepithelioma.

II. Endometritis of infective origin.

{ Acute Chronic	{	1. Puerperal.
		2. Gonorrhœal (Syphilitic).
		3. Tuberculous.
		4. Septic (from operative procedures, etc.
		etc.

III. Secondary changes.

{	1. Chronic œdema	{	Mucous polypus.
			General hyperplasia.
	2. Chronic venous congestion.		
	3. Increased vascularity.		

IV. New growth.

Simple.			Malignant.	
1.	{	Glandular
overgrowth.	1.	Malignant adenoma.
			2.	Adenocarcinoma.
2.			Papillary glandular hyperplasia.	3.
3.				

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