Remarks ON THE TREATMENT OF FIBROIDS OF THE UTERUS.*

BY
CUTHBERT LOCKYER, M.D., F.R.C.P.,
F.R.C.S.,

SURGEON TO IN-PATIENTS, SAMARITAN FREE HOSPITAL FOR WOMEN,
LONDON, W.

It has been variously estimated that uterine fibroids can be demonstrated in from 10 to 25 per cent. of all women, and Frank has stated that 45 per cent. of uterine fibroids require treatment. Uterine fibroids which cause no symptoms require no treatment; it may be wise to disclose their discovery to the patient's friends, and if the possessor of the tumour is conscious of its presence the growth should be kept under periodic observation. The advice of those radiologists who favour submitting a symptomless fibroid to x rays is countered by the recommendation to let sleeping dogs lie lest worse should befall.

Uterine fibroids requiring treatment may be dealt with by palliative or by curative measures, and the various operative procedures at our command are so thoroughly established that their discussion has fallen into the background, and modern debate has centred around the position at present held by radiotherapy.

In speaking of operative measures we feel we are dealing with unequivocal curative or radical treatment. According to the character and position of the fibroid the route of attack chosen may be vaginal or abdominal. The vaginal procedures include the removal of pedunculated fibroids from the body of the uterus and the cervical canal; they comprise hysterotomy or the splitting of the cervix with the removal by morcellement of sessile fibroids occupying the uterine cavity which are too large for avulsion after simple dilatation; many uteri are removed for fibroids which might be treated in this way. Finally, vaginal hysterectomy is admissible for a certain number of cases. Vaginal myomectomy by morcellement I have performed on six occasions for necrosing and sloughing fibroids the size of a twenty weeks' pregnancy. In one (reported) case I had to proceed to vaginal hysterectomy, in five the uterus was saved, but I have no knowledge as to subsequent pregnancy. Of vaginal hysterectomies for fibroids I have had thirty-three. All the cases did well; to these reference will again be made when considering treatment by radium. Abdominal operations for fibroids of the uterus include myomectomy, supravaginal amputation, and total hysterectomy.

Myomectomy.

Strenuous efforts are being made to popularize this seemingly safe and apparently ideal operation. Among the arguments in its favour use is made of the indisputable haemostatic value of radium. Should menorrhagia or metrorrhagia supervene after myomectomy, "we can fall back on radium"; should another fibroid develop, the same applies (Stephen Tracy, Gray Ward). I can hear the radiologist saying, "You should have come to me at the start."

The clear indications for this fascinating and conservative operation are: (1) to preserve for the non-gravid woman a functional uterus; (2) to cope with a surgical emergency in the gravid state. For a patient in the fertile period the removal of a few interstitial fibroids is a laudable procedure, but I have seen some thirty fibroids served up on a dish as a product of enucleation from a single uterus; I have seen a uterus (scarred all over and deformed by myomectomy for multiple interstitial growths) left behind, although bulky enough to lie well up in the abdomen after the operation was finished. Such sights convince me that other operators regard the utility of myomectomy in quite a different light from myself. My belief is that, following deep myomectomy with the opening up of the uterine cavity which is often necessary, convalescence is by no means

smooth and that morbidity is increased. Nineteen cases in the Mayo series came to subsequent operation "mostly for infection." When, however, the trifling superficial and the deep more serious myomectomies are grouped together the primary mortality of this operation can be made to compare favourably with that of hysterectomy. At the Rochester Clinic it is only 0.5 per cent., and Vineberg had a run of 123 cases with no mortality.

W. Mayo's statistics of myomectomy afford valuable information on the question of subsequent fertility. Of 741 myomectomies (abdominal 617 and vaginal 124) 59 subsequently became pregnant, 44 children were known to have been born, whilst 15 women were gravid at the time of reporting. Nineteen of these myomectomies were performed during pregnancy. Twenty-three women who had led sterile married lives were known to have had one or more children subsequent to operation.

The following notes of some cases of pregnancy after myomectomy are kindly supplied by Dr. Gibbon Fitzgibbon.

Case 1.—An unmarried woman, aged 35, with severe metrorrhagia, underwent myomectomy in May, 1919. A fibroid the size of a peeled walnut was removed from the fundus, and two others half that size from the posterior wall, all through one incision in the posterior wall. Twenty-seven other fibroids, varying in size from a large pea to a hazel-nut, were removed through an incision in the anterior wall. The tumours were all interstitial or submucous. Cavity opened. The patient married in 1922, and became pregnant in August, 1923. Progress to date normal.

Case 2.—Patient aged 36. An adenomyoma the size of a golf ball was cut out of the right cornu of the uterus, as it would not shell out, in April, 1922. She had been married four years; sterile. She was confined normally in May, 1923.

Case 3.—Patient aged 31; married one year. Fibroid the size of a good hen's egg enucleated through an incision in the anterior wall, another slightly smaller through an incision in the posterior wall. Confined spontaneously at term in January, 1923—that is, a year later.

Case 4.—Patient aged 36; married several years; sterile. Myomectomy in 1917—fibroid the size of a large foetal head enucleated from posterior wall and fundus. The uterus was very distorted and much enlarged. The patient was confined normally at term fifteen months later.

Dr. Fitzgibbon performed 56 hysterectomies, 38 abdominal myomectomies, and 7 vaginal myomectomies, all for fibroids, during three years.

The most emphatic way of conveying my opinion as to range of utility of a given operation is to state the use to which it has been put. In a series of 545 major operations for fibroids I have performed abdominal myomectomy 33 times, or in 6 per cent. of the cases; there was one death, due to the fact that a large umbilical hernia and massed adhesions of the small bowel had to be dealt with. Three portions of bowel were excised to prevent, as I hoped, a return of chronic obstruction, but this proved more than the patient could stand, and the myomectomy statistics suffer accordingly.

The restricted use to which I have put this operation—6 per cent. as compared with Dr. Giles's 16 per cent.—expresses my own views as to its limitations. I regard a deep myomectomy as involving somewhat greater risk than a supravaginal amputation, but this additional risk should be ignored if there is a chance of subsequent child-bearing. Considering the applicability of myomectomy to the gravid state I note that on six occasions I performed this operation to deal with some grave condition.

In two cases there were acute abdominal symptoms occasioned by a torsioned pedicle and strangulation of the growth. One went to term, the other miscarried within twenty-four hours with a seven and a half months foetus, which died soon after delivery, but the puerperium was normal. In the other four cases the pregnancy continued to term, the labours and puerperia being uneventful; the children were all healthy and lived. In Dr. Giles's series of thirteen cases eight children were known to be saved.

I submit (1) that myomectomy during pregnancy is well tolerated by the gravid uterus; (2) that it is not indicated for fibroids which lie well up in the abdomen and are causing no symptoms; (3) there is uncertainty in the presence of severe bleeding as to the possibility of saving the gravid uterus; this should act as a deterrent to performing myomectomy unless urgent symptoms call for interference, but in wisely selected cases it has proved to be a satisfactory operation.

* Introductory to a discussion at the Medical Society of London.

Supravaginal Amputation or "Subtotal Hysterectomy."

This operation has divided gynaecologists into two schools: (1) those who advocate its total abolition from the technique hitherto acknowledged to be classical; (2) those who are in favour of retaining an operation which has done more than any other to build up the solid reputation which surgery enjoys at the present day in the treatment of fibroids. History alone would be no justification for the retention of any surgical procedure which has served its day, however brilliantly, but ought now to be regarded as obsolete. If there were no halfway house, if a surgeon be called upon always and without exception to perform either a partial or a total hysterectomy in the radical treatment of fibroids, my own choice would soon be made—I should enlist under the totalists. Considered as a whole the latter have by far the best of the argument; but it is my conviction that the totalists go too far in refusing to admit that the easier, quicker, and, in certain cases, the safer operation has still a place in surgery. The special niche in the temple of surgery for this historic and laudable procedure of Baer's is a very small one maybe, but it is destined to remain. The risk of leaving behind a malignant or potentially malignant vaginal cervix can, with due care, be reduced to a minimum. If subsequent to bearing a child a woman requires radical treatment for a fibroid of the uterus, by all means remove the cervix. If a nullipara has suffered from chronic cervicitis, again remove the cervix. But very many subjects of uterine fibroids are elderly nulliparae and virgins with small, it may be atrophic, cervixes and with no internal complications requiring vaginal drainage. In such cases the vaginal cervix may be left with a logical sense of security, especially if the uterus is opened up and examined before the pelvic toilet is complete. Finally, I may here quote Professor Cullen, who says in a letter to me, "In many of our densely adherent cases an attempt to remove the cervix with the tumour would be almost criminal."

In 479 abdominal hysterectomies for uterine fibroids I have employed the supravaginal operation 284 times, with 5 deaths—a mortality of 1.76 per cent. There can be no question, then, as to the safety of the operation from the point of view of primary mortality; such danger as exists concerns the leaving of a potentially malignant cervix—carcinomatous or sarcomatous.

One or two of the arguments in favour of the supravaginal amputation which are advanced by the habitualists leave me cold, but I will reserve my criticisms thereon until I have said a few words on the subject of—

Total Hysterectomy.

This is an older operation than supravaginal amputation as we know the latter at present. In the *Medical Gazette* (London) for December 8th, 1843, we read that Heath performed total hysterectomy for myoma, with a fatal issue (from haemorrhage) in seventeen hours. The first successful panhysterectomy in which a myomatous uterus (together with both ovaries) was removed was done on June 25th, 1853, by W. Burnham of Lowell, but he seems to have abandoned the total method forthwith, for in the same year both he and Kimball performed the supravaginal operation successfully. It is easy to surmise that the reasons for substituting amputation at the vaginal junction for total hysterectomy had to do with the saving of time, the lesser risk from haemorrhage, and from damage to the ureter obtained by the amputation method. The relative risks of these two operations at the present time is a point to be carefully considered, and in doing so it is obvious at once that, if the primary mortality is the same for both, the subsequent risks involved by leaving the cervix become a strong reason for preferring the total operation.

But can we rely upon figures to answer this question of relative operative risk? I find it hard to do so for the following reasons: (1) So many total hysterectomies are done because the operator has no choice. He is compelled to remove the whole uterus for a large cervical fibroid, and he should do so in all septic cases—for example, pyosalpinx, suppurating ovarian tumours, and infected fibroids. (2) The same operator may, and often does, employ an amputation in easy cases—in fact, wherever circumstances do not compel

him to do otherwise. He will thus have two totally different types of cases in his operation series, and this distinction finds no true expression in bald statistics. Figures kindly supplied me by Dr. Fletcher Shaw, with permission to use them in this discussion, show what I mean. In 162 supravaginal amputations he had a mortality of 4.3 per cent.; in 57 total hysterectomies the mortality was 7 per cent. The reason for the higher mortality in the latter is that the four deaths occurred in exceptionally severe cases. Estimations of morbidity percentages would be influenced by the same factors.

Statistics prepared by Mr. McCullagh, Registrar of the Samaritan Hospital, show that of 203 "subtotal hysterectomies" performed in the last three years, four ended fatally = 1.97 per cent. mortality; whilst in 78 panhysterectomies there were seven deaths = 8.97 per cent. mortality. If, therefore, such figures could be taken at their face value it would mean that the total operation carried a risk four times greater than the partial hysterectomy, whereas they only represent the result of a selective process—that is, supravaginal amputation as routine, total hysterectomy when compelled. If we compare a large series of total hysterectomies performed by one operator with a concurrent series of the same operator's supravaginal amputations we shall obtain a much fairer and more reliable estimate. My thanks are due to Professor Miles Phillips for enabling me to do this. His series of total hysterectomies number 199, with five deaths = 2.54 per cent. about. His series of "subtotal" hysterectomies number 258, with three deaths = 1.16 per cent. Again, I find a review of my own experience is a help in this matter. My series of total hysterectomies for fibroids number 195, with three deaths = 1.54 per cent.; my series of supravaginal amputations number 284, with five deaths = 1.76 per cent.

Taking Miles Phillips's results and mine together it seems fair to make the deduction that the primary risk of the two operations varies within quite small limits, but what difference there is is slightly in favour of the "subtotal" operation. Before investigating this point I imagined that results would register a much higher relative mortality against the total operation, and was tempted to think that if total hysterectomy became general the increased primary mortality rate would more than outweigh the risks entailed by leaving the cervix. This view I no longer hold, and therefore my figures—195 total as opposed to 284 partial hysterectomies—need explaining. The reason for the larger number of supravaginal amputations is due to the fact that before I encountered three cases of cancer in the stump my habit was to employ the partial operation, and time has not yet allowed me to redress the balance and reverse the figures. In a letter from Miles Phillips he says, "I have never regretted doing a total hysterectomy, but I have occasionally regretted not doing it." I share this feeling, being ready to acknowledge that though I am unconscious of having left behind a potentially malignant cervix in my series of amputations, such cases may have existed and gone elsewhere for treatment. Dr. Oldfield of Leeds, in writing to me on this subject, allows me to make use of the fact that after a subtotal hysterectomy bleeding occurred a month later and he removed the cervix for cancer; the patient was known to be well up to two years later. Also in another case of his a growth was noticed in cutting across the cervix; radium was applied later, but the growth increased rapidly and death followed. It is of vast importance that such experience should come to light. At the Rochester Clinic there have been 13 such cases. Polak mentions 256 cases of cancer of the stump, all of which occurred after one year, and another series of 20 cases is mentioned in American literature. Cullen writes, February, 1924: "We have seen carcinoma develop in the cervix stump years after supravaginal hysterectomy, and I have one in the ward at present. At most we have only had four or five such post-operative complications in over thirty years." As long ago as 1806 the President, Dr. Herbert Spencer, collected 28 cases, so that considerably over 300 have already been published. Furthermore, routine serial sections of 900 total hysterectomies have shown that cancer coexisted in the stump in more than 2 per cent. To the risk of cancer must be added that of sarcoma, which, although not great, cannot be overlooked.

One of the main points in the arguments for the partial operation is that the vagina is left intact, whilst with the total operation it is shortened. I contend that there is no need to shorten the vagina in performing the total operation. Whilst drawing up the cervix the vagina can be dissected off the latter almost down to the external os, and if the lateral stumps, including the round ligaments, are sutured to the vaginal angles there is no sagging; on the contrary, the passage is actually lengthened by the absence of the vaginal cervix, its upper limit being that of the original fornices.

As regards morbidity, simple cases run as smoothly after the total as after the subtotal operation, and purulent cases do better with the vaginal drainage afforded by the total operation than without. Do all these considerations justify one in condemning the partial operation to the extent of its total abolition? I do not think so; the easier and quicker operation may, on occasion, be justifiable where the longer, more tedious, and bloody procedure would not. Consideration of the claims for the total operation should lead to utmost caution in the selection of cases for the quicker operation; they should have a most sobering effect on our judgement, but a "habit" may be cured without total prohibition.

The Fate of the Ovaries.

As hysterectomy for fibroids is more often performed on women over the age of 40, it might be argued with some plausibility that the sacrifice of both ovaries is of no importance. My own view is that even above that age it is better to conserve one or both ovaries if these organs are healthy, and I raise this question of oöphorectomy because it is known to be the custom of some operators of large experience deliberately to remove all ovarian tissue in every hysterectomy for fibroids which they perform. Miles Phillips writes: "I firmly believe the majority of patients are more comfortable and satisfied if both ovaries are removed with the uterus. In my early days I took pains to conserve ovaries, but I gradually came to realize that those women in whom all ovarian tissue had been removed for one reason or another gave the most perfect results. I have tested the matter in all possible ways and now have no doubt in my own mind." In the same letter this authority states that 185 hysterectomies were performed for patients between 21 and 40 years of age, and 18 for patients between 21 and 30: I should have expected very severe menopausal symptoms to have followed the spaying, especially in the younger patients. Cullen states (February 5th, 1924): "In patients prior to the menopause the tubes and ovaries are invariably saved unless diseased or unless they are perched so high on the tumour that their salvage is fraught with danger to the patient." Professor Blair Bell writes to say that "When conservation of the normal ovary in the normal situation is not feasible owing to infection of the appendages or other reasons, I always make an ovarian graft in women under 40 years of age." That is exactly what I imagine to be the practice of most of us present here to-night; in fact, I believe the Manchester, Birmingham, and Sheffield schools to stand alone in advocating routine castration during hysterectomy for fibroid.

Radiotherapy.

The value of x rays and radium in checking haemorrhage is now universally admitted. As haemorrhage is the most prominent symptom of uterine fibroids, it might naturally be inferred that radiotherapy would find a large field of utility in dealing with these growths. Experience has already shown that the symptomatic treatment of uterine fibroids by radio-active bodies is by no means without inherent risks. Complete haemostasis can only be effected by a "bloodless castration" which (*pace* the fore-named schools) is a disaster for a woman under 40. Quantitative dosage—the scientific measurement of administrative rays so as to bring about a given alleviation of symptoms—has yet to be attained. The claims that are made in this direction do not carry conviction, but there seems more hope for the control of radium than for bringing Roentgen rays into quantitative subjection.

Time does not permit of discussing the value of radiotherapy in general, and to-night we must confine our remarks to the treatment of uterine fibroids. A full knowledge of the life-history and associated conditions of uterine fibroids is essential to anyone who presumes to treat these tumours, and this is what so many radiologists appear to lack—absence of all knowledge of morbid anatomy and general pathology can alone account for some of the extravagant claims which are made; phenomenal size of the growth, the presence of pyosalpinx, degeneration of the tumour, are no contraindication to the use of the Coolidge tube according to some x-ray enthusiasts. On the other hand, surgeons who have studied pelvic pathology have come to realize that, whilst radiotherapy is an undoubted handmaid to gynaecology, its uses where fibroids of the uterus are concerned is confined within extremely narrow limits—some putting it at 10 to 17 per cent. of all cases requiring treatment, others placing it as low as 5 per cent. Its mortality risk has been placed at 1.5 per cent. (Harold Bailey), which is about where hysterectomy stands, and the risks of actual fatality are by no means so negligible, so that it becomes a greater responsibility to advise the use of radiotherapy than to advise a radical curative operation. The feeling of this responsibility is due largely to a sense of insecurity of diagnosis. I have known an ovarian cyst x rayed for years with very untoward results. Carlton Oldfield writes of a similar experience (not his own), and examples are multiple.

In spite of the fact that as long ago as 1904 Hett of Ontario treated fibroids "successfully" by x rays, there is a complete absence of knowledge as to what will be the ultimate fate of the irradiated tumour, and this adds to our sense of insecurity. One hoped that the early claims of Kroenig and Gauss of 100 per cent. cures and an applicability of 85 per cent. would be toned down by riper experience as time went on; but when we read in the literature of 1923 that "90 per cent. of all fibroids may be dispersed by x rays or radium without serious risk or discomfort" (a quotation of Nigel Stark's), and when Bécclère states that his experience of 700 cases teaches him that "the only conclusion permissible is that the sole obstacle to successful treatment is the submucous myoma," we are completely staggered by such exaggerated claims. It is not surprising that Weiss, in a most judicial paper on the treatment of fibroids, said the object of his communication was to condemn the indiscriminate use of radium; or to find Gillhorn stating that "the man who administers radiotherapy indiscriminately disregards the best interest of the patient." "The indiscriminate use of radium will lead to a high mortality," says Weiner; and another American authority (Frank) puts it, "X-ray therapy needs to be protected from its friends." Granted that radiotherapy is of great value in the treatment of a prescribed number of uterine fibroids, we have to decide two questions: (1) What are its limitations? (2) In what form is it best employed? In attempting an answer to the first consideration I should include: (1) Some of the 33 cases in which I performed vaginal hysterectomy—that is, cases in which the operative mortality was *nil*, the tumours relatively small, and uncomplicated by degeneration or diseased appendages; cases, that is, in which the symptomatology closely simulates the myopathic uterus (chronic metritis) by causing the postponement of the menopause, with severe bleeding after the age of 40. (2) Cases of uncomplicated fibroids requiring treatment but in which considerations of the general health contraindicate operation—for example, cardiac and renal diseases, Graves's disease, diabetes, phthisis, and other respiratory complications, and finally dread of operation. (3) As an alternative to blood transfusion in cases of profound secondary anaemia to render the patient fit to stand radical curative measures. Weiss records eight cases with a haemoglobin percentage below 35 which were treated by radium, and in two of them the uterus was removed subsequently.

As a mode of employment, whether to use x rays or radium, there is no doubt in my mind that the latter is in every way preferable. The application of radium, after intrauterine exploration and curettage, has the great advantage of simplicity of technique and rapidity in action. One application is usually sufficient to check haemorrhage. Moreover, it is claimed that radium is less destructive to ovarian

tissue than are x rays, whilst its effect on the uterine muscle is greater.

Taussig states that "radium is less likely to produce vomiting, cramps, and catarrhal stools," and that it will induce amenorrhoea when x rays have failed. In the use of radium we have a better conception of dosage than when x rays are employed.

My own experience with the use of radium in the treatment of haemorrhage has been in chronic metritis, and the results have been so favourable that I shall be tempted to extend its application to the treatment of haemorrhage in cases of small uncomplicated uterine fibroids at the time of the climacteric—in other words, for this group of cases I regard it as legitimate to consider the use of radium as an alternative to hysterectomy.

In conclusion, if asked "In what cases do uterine fibroids still require operative removal?" my answer would be, In 55 per cent. of all fibroids no treatment whatever is needed. In the remaining 45 per cent., 35 per cent. require removal, leaving 10 per cent. to be dealt with by radium. This is equivalent to stating that the field for operation is from three to four times as great as that for radiotherapy.

In the treatment of uterine fibroids surgery and radiotherapy may be run tandem—but to radiotherapy we assign a very subsidiary status.

THE PATHOLOGY AND SYMPTOMS OF DUODENAL ULCER.*

BY

H. TYRRELL GRAY, M.A., M.C.CANTAB.,
F.R.C.S.ENG.,

SURGEON TO THE WEST LONDON HOSPITAL, AND TO THE HOSPITAL
FOR SICK CHILDREN, GREAT ORMOND STREET, ETC.

In contrast to gastric ulcer, increased activity of the stomach, both motor and secretory, is a characteristic feature in subjects of duodenal ulcer. Indeed, this increased activity (the duodenal type of stomach) may be regarded as the essential predisposing condition, and depends on the derangement of the normal neuro-muscular mechanism of the stomach.

Neuro-muscular Mechanism.

Though this is as yet imperfectly understood, clinical evidence is of the greatest assistance to a correct understanding. There are three points to be emphasized:

1. True peristalsis (that is, the combination of a deeply contracting segment immediately proximal to a synchronously inhibited segment) is seen neither in the oesophagus nor in the fundus of the stomach, but commences approximately at A-B (see figure), as proved both by radiography and direct inspection during laparotomy. True peristalsis is characteristic of those parts of the gastro-intestinal tract which are influenced by a dual antagonistic nerve control—(1) *motor* (that is, parasympathetic), acting through Auerbach's plexus; and (2) *inhibitory* (that is, sympathetic), acting perhaps through Meissner's plexus.¹ The inference is that the sympathetic only enters on its inhibitory functions at A-B. This receives support from a consideration of the second point.

2. In his study of Auerbach's plexus Keith² described a nodal point at A (see figure), and found that mechanical stimulation evoked a contraction on the greater curvature. That an ulcer in this situation produces the most marked spasmodic hour-glass stomach indicates that in both the stimulation of Auerbach's plexus at this point excites the greatest motor response, because there is here little or no counterbalancing sympathetic excitation to inhibit this phenomenon. The spasmodic hour-glass stomach opposite an ulcer at A may be obliterated by "pulling" during laparotomy, and will often repeatedly re-form (a feature progressively less pronounced as the duodenum is approached); but an incisure opposite an ulcer in the intestine is absolutely unknown, and manipulation only induces inhibition.

3. X-ray observations demonstrate a normal period of delay in the passage of food through the pylorus—a delay accentuated by over-excitation of the sympathetic (that is, by apprehension, anxiety, etc.), and associated with diminished secretory activity (the antithesis of "the duodenal stomach"). Perhaps I may be allowed to emphasize again³ that clinical evidence supports the

view that pyloric closure is controlled by the sympathetic, as Elliott⁴ has shown to be the case in the ileo-caecal valve. It is reasonable, then, to regard the fundus of the stomach, proximal to A-B, as a dilated pouch of the oesophagus controlled by the vagus alone. From this point onwards the sympathetic enters on its antagonistic inhibitory control with progressively increasing domination.

On these grounds we may assume that predisposition to a duodenal ulcer ("the duodenal stomach") is hyperactivity, due to a relative increase of normal vagus control, insufficiently balanced by normal sympathetic inhibition.

The pathology of duodenal ulcer is dependent, then, on two sets of factors—one predisposing and the other exciting.

PREDISPOSING FACTORS.

The predisposing factor is the relative increase of vagus excitation established by diminution of sympathetic control or by increased vagus stimulation.

Diminution of Sympathetic Control.

Now there is an outstanding example of an alkaloid which paralyses sympathetic ganglion cells—that is, nicotine. On these grounds I have for some years prohibited smoking in cases of duodenal ulcer.

(a) *Influence of Tobacco.*—The proportion of men to women is roughly four or five to one (in itself perhaps some indication of the influence of nicotine), and 96 per cent. of the males were smokers. I have endeavoured to divide the smokers into three groups: excessive, heavy or continuous (together comprising 60 per cent.), and mild smokers (40 per cent.) in whom it was not a fixed habit.

Of the smokers, 22 per cent. abandoned the habit, or nearly so, with the result that, independently of the character of the surgical treatment instituted, 90 per cent. were cured, 8 per cent. greatly relieved (98 per cent.), and 2 per cent. only failed. A mild reminder of the original symptoms was voluntarily attributed to tobacco in 5 per cent. of these. Where tobacco was unchecked, only 47 per cent. were cured, and 12 per cent. recurred. Recurrence is four times as frequent in non-abstainers. The comparison is still more striking in Table I.

TABLE I.

	Abstained.	Habit Unaltered.
Excessive smokers (29%)	Cured ... 90% Relieved ... 8% Recurred... 0 Failure ... 0	Cured ... 33% Relieved ... 15% Recurred...=33% Failure ...=13%
Heavy or continuous smokers (31%)	Cured ... 55% Relieved ... 45% Recurred... 0	Cured ... 44% Relieved ... 33% Recurred...=22%

In mild or occasional smokers the influence on the result is negligible, while 14 per cent. of those who did not vary their consumption volunteer that their "reminders," or occasional "stomach upsets," are attributable to tobacco. In one instance recurrence after six years' complete immunity following operation was definitely attributable to gross over-indulgence. The influence of tobacco in the development of duodenal ulcer will be further elaborated, but mention must be made here of a possible second factor in the diminution of sympathetic control.

(b) *Sex.*—I have long noted that symptoms of visceral disorders in women are often either accentuated or relieved by the onset of the climacteric. Now we know that the suprarenal medullary hormone is an adjuvant to sympathetic nerve stimulation; and, since the antagonistic vegetative nerve impulses normally balance each other, it is reasonable to infer that their chemical associates similarly contribute to the establishment of a physiological equilibrium. Falta (quoted by Higier)⁵ classifies the hormone of the sex glands with the adrenal medullary hormone; and it is here suggested that perhaps the loss of this ovarian inhibitory influence at the climacteric may contribute to

* A lecture delivered to the Nottingham Medical Society, February 20th, 1924.