

**Fibroid Tumours of the Uterus: a Study of the degenerations and complications in 2,274 consecutive cases, including 337 cases of the writer's; also a study of 4,880 consecutive cases in their relation to Carcinoma and Sarcoma of the Uterus.\***

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As early as 1894, as a result of the observation of the clinical history of women suffering from fibroid tumours, I became convinced of the fallacy of the classical teaching concerning the natural history of these tumours. At the time, I had operated upon but thirty women suffering from fibroid tumours. At the close of a paper read in 1894 (Noble, Charles P. Uterine Fibroids. *Med. and Surg. Reporter*, June 2, 1894), I said: "The comparatively small number of operations which I have done for fibroid tumours is evidence of the fact that for a long time I was profoundly influenced in my practice by the classical teaching concerning this disease. It was not until my own observations convinced me of the fallacies of that teaching that I felt justified in resorting to the removal of fibroid tumours except in the worst class of cases. I am coming more and more to believe, however, that it is the part of wisdom to remove fibroid tumours which are producing symptoms as soon as they are discovered; in other words, that the principle of early operation which is now generally accepted with reference to ovarian tumours is equally applicable in the treatment of fibroid tumours." During the past twelve years every phase of the subject of fibroid tumours of the uterus has engaged my attention and diligent study, and I desire to present to you the results of my own experience with the subject and my study of its literature.

In 1897 sixty-six hysteromyomectomies had been performed (Noble, Charles P. The Development and the Present Status of Hysterectomy for Fibromata. *Trans. Amer. Gynec. Soc.*, 1897). The degenerations and complications present in these 66 women were tabulated and analysed, and the conclusion was drawn that

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20 of the women, or about 30 per cent., would have died as a result of degeneration in the tumour itself or of the complicating diseases of the uterus, the tubes, or the ovaries.

In 1901 the number of patients operated upon for fibromyoma of the uterus had increased to 218. These cases were tabulated, analysed, and studied in a paper read before the British Gynæcological Society (Noble, Charles P. *The Complications and Degenerations of Fibroid Tumours of the Uterus as Bearing upon the Treatment of these Growths. Brit. Gynæc. Journ.*, Nov., 1901). The complications and degenerations were divided into three classes: (1) Those which lead to the death of the patient; (2) those threatening the life of the patient; and (3) those predisposing to more or less permanent invalidism of the patient. Of the 218 women operated upon, it was estimated that 66, or 30 per cent., would have died from the complications and degenerations present; that the life of 25 was threatened, and that in 30 others the patients were suffering from more or less permanent invalidism.

In this connection the idea was developed that the proper method of studying the real nature of fibroid tumours was to study a consecutive series of cases, carefully noting the natural history of the tumours, the degenerations present in the tumour itself, and the complications present in the uterus, in the adnexa, and in other organs. It was held that in this way only a true estimate of the dangers of fibroid tumours could be reached. Reference was made to the only paper previously published in any way bearing upon the subject, in which the complications of fibroid tumours in the tumour and uterus itself met with in 205 cases were tabulated by August Martin (Martin, A. *Pathology and Therapeutics of the Diseases of Women. Boston, 1900, pp. 268—272*).

Such questions were discussed as sarcomatous degeneration, necrosis of the tumour, the relation of the menopause to fibroid tumours, the disappearance of fibroid tumours after the menopause and after labour, the ages of the patients operated upon, sterility, phlebitis, embolism, anæmia, carcinoma as a complication, and death from fibroid tumours in the natural course of the disease. The conclusion was drawn that upwards of one-third of women suffering from fibroid tumours would die without operation, as contrasted with a mortality of less than 10 per cent. from operation.

The plan advocated in that paper, to study definite consecutive series of cases, bore fruit, and since that time a number of valuable papers have appeared, each paper consisting of a study of a consecutive series of fibroid tumours treated by operation; so that, at the

present time I am able to present for your consideration a study of the degenerations and complications in 2,274 cases of fibromyoma of the uterus.

It must be insisted upon that each of the series reported by the various authors is *consecutive*. The importance of this fact is at once evident, as it means that the entire subject is presented for your consideration and not merely a study of the particular phases of the subject or the particular cases which may have interested the individual authors. The series in the order of publication is as follows:—

Martin .....	205
Noble .....	337
Cullingworth.....	100
Frederick .....	125
Scharlieb .....	100
Watt-Keen (Hofmeier's Clinic) .....	300
Hunner .....	100
McDonald .....	280
Lauwers .....	200
Eastman .....	117
Webster .....	210
Martin, F. H. ....	200
Total .....	2274

#### COMPLICATIONS AND DEGENERATIONS IN 2274 CASES OF FIBROID TUMOUR.

##### *Conditions Relative to the Tumour and Uterus:—*

	No.	Per Cent.
Carcinoma of the corpus uteri .....	42	1·8%
Epitheliomatous infiltration of a fibroid tumour arising from adeno-carcinoma of the corpus uteri by metaplasia .....	1	
Carcinoma of the cervix uteri .....	16	·7%
Sarcoma .....	34	1·4%
Chorio-epithelioma .....	2	
Necrosis of tumour .....	119	4·7%
Myxomatous degeneration .....	89	3·4%
Cystic degeneration .....	58	2·5%
Hyaline degeneration .....	72	3·1%
Hyaline degeneration and calcareous infiltration .....	8	·25%
Fatty degeneration .....	7	·30%
Hæmorrhagic degeneration .....	13	·57%
Calcareous infiltration .....	39	1·7%
Edema of tumour .....	17	·74%
Twisted pedicle, pedunculated tumour .....	3	·13%
Dangerous uncontrollable hæmorrhage .....	41	
Intraligamentous development of tumour .....	80	3·5%
Subvesical development of tumour .....	2	
Adeno-myoma .....	12	

*Conditions Relative to the Uterus:—*

Procidentia uteri .....	15
Retroversio uteri .....	29
Pregnancy .....	13
Pregnancy, ectopic .....	6
Pregnancy, ectopic, salpingitis and hydrosalpinx .....	1
Endometritis, senile .....	3
Endometritis, suppurating .....	5

*Conditions Relative to the Ovary:—*

Dermoid cyst .....	10
Dermoid cyst, suppurating .....	3
Dermoid cyst with twisted pedicle .....	1
Dermoid cyst, suppurating; sinus through abdominal wall from drainage operation .....	1
Dermoid cyst, bilateral; umbilical hernia .....	1
Ovarian cyst, suppurating .....	4
Ovarian cyst with twisted pedicle .....	2
Ovarian cyst, bilateral .....	16
Ovarian cyst, unilateral .....	115
Cystic degeneration of ovaries .....	87
Chronic interstitial oöphoritis, bilateral .....	31
Chronic interstitial oöphoritis, unilateral .....	3
Calcification of ovary .....	1
Fibroma of ovary .....	3
Carcinoma of ovary .....	4
Papillary carcinoma of both ovaries .....	1
Hæmatoma of ovary .....	18
Abscess of ovary, bilateral .....	2
Abscess of ovary, unilateral .....	9
Tubo-ovarian abscess .....	2
Parovarian cyst .....	14

*Conditions Relative to the Uterine Ligaments:—*

Cyst of broad ligament .....	2
Hæmatoma of broad ligament .....	7
Abscess of broad ligament .....	1
Myoma of uterine ligaments .....	4

*Conditions Relative to the Fallopian Tubes:—*

Hæmatosalpinx .....	10
Pyosalpinx, bilateral .....	33
Pyosalpinx, unilateral .....	36
Pyosalpinx and tubo-ovarian abscess .....	2
Hydrosalpinx, bilateral .....	17
Hydrosalpinx, unilateral .....	68
Hydrosalpinx and tubo-ovarian abscess .....	1
Salpingitis, bilateral .....	48
Salpingitis, unilateral .....	66
Salpingitis and pyosalpinx .....	7
Salpingitis and hydrosalpinx .....	3
Salpingitis and tubo-ovarian abscess .....	3
Fibroma of Fallopian tube .....	1
Papilloma of uterine appendages .....	1

*Conditions Relative to the Pelvis outside the Tumour, Uterus or its Appendages :—*

Varicose veins of the pelvis .....	9
Thrombosis of veins of lower extremities .....	2
Chronic pelvic peritonitis .....	4
Tubercular peritonitis .....	4
Universal adhesions .....	4
Adhesions to viscera .....	34
Adhesions to tumour .....	5

*Conditions Relative to Pressure from the Tumour :—*

Intestinal obstruction, chronic, from tumour pressure...	7
Intestinal obstruction, acute, from tumour pressure ...	2
Dilated ureters from tumour pressure .....	2
Hydronephrosis, large, from tumour pressure .....	2

*Conditions Relative to Complications Outside the Pelvis :—*

Appendicitis .....	54
Hernia .....	7
Hernia, ventral .....	1
Hernia, umbilical .....	7
Carcinoma of umbilicus .....	1
Extreme anæmia from hæmorrhage .....	41
Phthisis pulmonalis .....	2

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Total ..... 1553

1553 cases complicated out of 2274, or 68%.

This formidable list of degenerations and complications in the tumour and uterus encountered in 2,274 woman operated upon for fibroid tumour by no means portrays the entire list of complications. For example, in the lists of both Cullingworth and Scharlieb, the authors expressly exclude all patients operated upon for necrotic fibroids by the vaginal route, on the ground that no one questions the necessity for operation in such cases. Likewise, in Lauwers' list, only abdominal hysterectomies are tabulated, whereas, if the tumours operated upon *per vaginam* were included, the percentage of necrosis would inevitably be higher, as the necrotic submucous fibroids, almost without exception, are operated upon by the vaginal route. Among the early cases in my own experience there is no doubt that no record was made of many of the degenerations, more especially such as myxomatous degeneration, œdema and the earlier stages of cystic degeneration.

*Conditions Relative to the Tumour and the Uterus in 2274 Cases which would be Fatal without Operation:—*

Carcinoma of the corpus uteri .....	42
Epitheliomatous infiltration of a fibroid tumour arising from adeno-carcinoma of the corpus uteri by metaplasia .....	1
Carcinoma of the cervix uteri .....	16
Sarcoma .....	34
Chorio-epithelioma .....	2
Necrosis of tumour .....	119
Cystic degeneration .....	58
Twisted pedicle, pedunculated tumour .....	3
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Total.....	275=12%

A certain number of the cases of myxomatous and hyaline degeneration and of œdema of the tumour would become cystic or necrotic, which would probably increase the mortality in this class of cases 3 or 4 per cent., and thus give a mortality of from 15 to 16 per cent.

From this table the conclusion must be drawn, that of the 2,274 women, 275, or 12 per cent., would have died from the degenerations and complications in the tumour and uterus itself, had operation not been performed; and, in addition, an unknown number would have died from myxomatous and hyaline degenerations and œdema of the tumour.

It is of interest to compare this large series of 2,274 cases with the total number of fibroid tumours which have come under my own observations (337), and also with my last 100 abdominal hysterectomies for fibroid tumour.

*Conditions Relative to the Tumour and Uterus in the Writer's 337 Cases which would be Fatal without Operation:—*

Adeno-carcinoma of the corpus uteri .....	8
Epitheliomatous infiltration of a fibroid tumour arising from adeno-carcinoma of the corpus uteri by metaplasia .....	1
Carcinoma of the cervix uteri .....	5
Sarcoma .....	2
Chorio-epithelioma .....	1
Necrosis of tumour .....	22
Cystic degeneration of tumour .....	7
Twisted pedicle, pedunculated tumour .....	2
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Total .....	48=14%

*Conditions Relative to the Tumour and Uterus which would be Fatal without Operation, in the Writer's last 100 Consecutive Cases subjected to Abdominal Hysterectomy:—*

Carcinoma of the corpus uteri .....	5
Epitheliomatous infiltration of a fibroid tumour arising from adeno-carcinoma of the corpus uteri by metaplasia .....	1
Carcinoma of the cervix uteri .....	2
Cystic degeneration of the tumour .....	2
Necrosis of tumour .....	4
Twisted pedicle, pedunculated tumour .....	1
Total.....	15 = 15%

Thus in the total series of 2,274 cases, 12 per cent. are estimated as fatal; in the series of 337 of the writer's cases, 14 per cent. are estimated as fatal; and in the last 100 hysterectomies in the writer's practice, 15 per cent. are estimated as fatal from degenerations in the tumours or complications existing in the uterus.

**OPERATIONS PERFORMED FOR FIBROID TUMOURS OF THE UTERUS BY THE WRITER TO FEBRUARY 26, 1906.**

Abdominal supravaginal hysterectomies .....	235
Abdominal panhysterectomies .....	14
Abdominal myomectomies .....	22
Removal of ovaries, etc. ....	15
Cœliotomies .....	286
Vaginal hysterectomies .....	7
Vaginal myomectomies .....	44
Total .....	337

**DEGENERATIONS AND COMPLICATIONS OF FIBROID TUMOURS IN A SERIES OF 337 CONSECUTIVE CASES IN THE PRACTICE OF THE WRITER.**

*Conditions relative to the Tumour and Uterus:—*

Adeno-carcinoma of the corpus uteri .....	8
Epitheliomatous infiltration of a fibroid tumour arising from adeno-carcinoma of the corpus uteri by metaplasia .....	1
Carcinoma of the cervix uteri .....	5
Sarcoma .....	2
Chorio-epithelioma .....	1
Necrosis of tumour .....	22
Myxomatous degeneration .....	8
Cystic degeneration of tumour .....	7
Calcareous infiltration of tumour .....	7
Twisted pedicle, pedunculated tumour .....	2
Hyaline degeneration of tumour .....	3
Intraligamentous development of tumour .....	21
Adeno-myoma .....	4

*Conditions relative to the Uterus:—*

Procidentia uteri .....	6
Retroversio uteri .....	6
Pregnancy, ectopic .....	3

*Conditions relative to the Ovary:—*

Dermoid cyst .....	1
Dermoid cyst with twisted pedicle .....	1
Dermoid cyst, suppurating; sinus through abdominal wall from drainage operation .....	1
Dermoid cyst, bilateral; umbilical hernia .....	1
Ovarian cyst, suppurating .....	2
Ovarian cyst with twisted pedicle .....	1
Ovarian cyst, bilateral .....	3
Ovarian cyst, unilateral .....	24
Cystic degenerations of ovaries .....	11
Chronic interstitial oöphoritis, bilateral .....	2
Adeno-carcinoma of ovary .....	1
Papillary carcinoma of both ovaries .....	1
Abscess of ovary, unilateral .....	3
Parovarian cyst .....	2

*Conditions relative to the Uterine Ligaments:—*

Abscess of broad ligament .....	1
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*Conditions relative to the Fallopian Tubes:—*

Hæmatosalpinx .....	1
Pyosalpinx, bilateral .....	10
Pyosalpinx, unilateral .....	6
Hydrosalpinx, bilateral .....	11
Hydrosalpinx, unilateral .....	9
Salpingitis, bilateral .....	6
Salpingitis, unilateral .....	11

*Complications outside the Tumour, Uterus and Appendages:—*

Chronic pelvic peritonitis .....	4
Appendicitis .....	17

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Total ..... 236

THE TRUSTWORTHINESS OF THE TABLES EMBRACED IN THIS PAPER.

The common statement that statistics are misleading is familiar to us all. With reference to the tables and statistics in this paper every care has been taken to make them accurate. My own series of 337 cases has been tabulated by Dr. Stephen E. Tracy, who has prepared the tables for all my various papers (including this one) on fibroid tumours for the past six years. In but two instances was any liberty taken as to including or excluding a case from the table. In one case, in which an operation was attempted for cancer



of the cervix, it was abandoned because of secondary cancerous deposits. The woman had a fibroid tumour, but it was considered best to exclude the case. In another instance a woman was operated upon for pelvic abscess and a hysterectomy was performed. In the pathological report it was stated that a tiny fibroid was present in the uterus. This case also was excluded. In both instances it was felt that the tables would be more accurate by excluding these border-line cases. Otherwise, the facts are as found in the records. There is no doubt, however, that numerous degenerations and complications have been omitted in my early cases, because at that time I was not in the habit of making such careful records when a patient was operated upon for fibroid tumour. That diagnosis alone was recorded. Hence the facts as to degenerations and complications in my own series are worse than the figures given.

In editing the reports of others, in order to simplify and shorten the list of complications and degenerations, the following changes have been made:—

Serious adhesions to soft parts, extensive intestinal adhesions and adhesions, are classified with adhesions to viscera.

Suppuration, necrosis in centre of tumour and necrobiosis, are classified with cases of necrosis.

Malignant adenocystoma of ovary is classified with carcinoma of ovary.

Ovarian cysts, large, are classified with ovarian cysts.

Abscess of ovary is classified with abscess of ovary, single.

Cases of salpingo-ovaritis are classified as salpingitis.

All cases of ovarian cysts, pyosalpinx, hydrosalpinx and salpingitis, in which mention was not made as to whether the condition was bilateral or unilateral, are classified as unilateral.

The tables from the recent German literature have been prepared by Dr. Brooke M. Anspach.

In the discussion upon a former paper on fibroids, one gentleman spoke of the statistics supplied as pre-arranged, conveying the implication that, having a theory to sustain, I had collected statistics which would uphold the theory. Not to refute such an insinuation, but in the interest of truth, I would draw attention to the following facts:—

Cullingworth, Scharlieb, Kelly and Winter, from whom more than half of the cases have been secured, are adherents of the classical position; namely, that the gravity of fibroid tumours should be estimated by the symptoms which they produce at the time they

are under observation, and that operation is only indicated at a given time when the symptoms present threaten life.

If the facts supplied by these gynæcologists are contrary to the classical teaching, it is simply additional evidence of its fallacy.

THE FACTS WITH REFERENCE TO THE DEGENERATIONS AND COMPLICATIONS OF FIBROID TUMOURS ARE WORSE THAN INDICATED BY THE TABLES.

In various sections of this article reference has been made to the omission of degenerations and complications by different gynæcologists from whom tables have been taken for some particular reason which appealed to them, together with the statement that had these complications been included it would make the facts shown by the tables worse than they now appear. It must not be forgotten also that in recording the degenerations and complications found in women operated upon for fibroid tumours the system in use in clinics is not perfect, and that many such degenerations and complications have therefore not been recorded. This is certainly true of my own early cases. It is also evident, in reading the lists of complications, that many are omitted. Only nine cases of varicose veins of the pelvis are recorded; only two of thrombosis of the veins of the lower extremity; only four of chronic pelvic peritonitis; only thirty-four of adhesions to viscera; only five of adhesions to the tumour; no case of cystitis (a frequent complication); only three of twisted pedicle (two from my own series); and no case of phlebitis or thrombosis, although I have seen at least two myself. Anyone familiar with fibroid tumours, as they are met with in the operating room, will at once see that there are many omissions in the tables covering a series of 2,274 cases. All of us, also, are influenced by our early teachings. Doubtless the number of cases of cancer is far larger than is reported in the tables, because if a well-developed cancer is complicated by a small fibroid, the cancer being the major condition for which the operation is done, the fibroid makes little or no impression upon the surgeon, and frequently in the past, no doubt, its presence has not been recorded. The same is true of pyosalpinx, ovarian abscess and ovarian tumour, when existing in association with a small fibroid tumour of the uterus. The influence of tradition has doubtless caused the omission of any record of the fibroid in many of these cases.

These facts are insisted upon to demonstrate the fallacy of the argument that the tables make too bad a showing, because of the women having fibroid tumours who are not operated upon, and who

are therefore omitted from the tables. There is no doubt that a certain percentage of fibroid tumours are not removed, but at the present time, sooner or later, a great majority of them are removed. It is easy to state that many women have fibroid tumours which produce no symptoms, and that therefore they do not consult a physician; but it is at once manifest that this is a bald statement without any evidence in its support. That there are such cases all will admit, but that they are frequent there is no evidence whatever. If those who support the classical or traditional position wish to furnish a valuable contribution to our knowledge of the subject, they should study the autopsy records of almshouses, old women's homes and similar institutions, in which consecutive autopsies are made and recorded. If such records are to be found, made under definite conditions, it would be possible to throw some light upon the frequency of fibroid tumours which produce few or no symptoms. I know of no other way of arriving at these facts.

#### CANCER AS A COMPLICATION OF FIBROMYOMATA.

The relation of fibroid tumours of the uterus to cancer of that organ is one of special interest. In discussing my own experience with this question in 1897, I stated that it indicated that malignant disease may be a more frequent complication of fibroid tumours than is usually believed. In 1901, in 218 patients I had met with adenocarcinoma of the body of the uterus in three and epithelioma of the cervix in four. This fact led to the statement that in proportion to its relative frequency adenocarcinoma of the body of the uterus is more often associated with fibroid tumours than is the more common squamous epithelioma of the cervix. In 1904, out of 278 women with fibroid tumours there were four cases of epithelioma of the cervix and six cases of adenocarcinoma of the corpus uteri (Noble, Charles P. "The Nature of the Indications for Operation for Fibroid Tumours of the Uterus." *Amer. Medicine*, Sept. 10th, 1904, pp. 451-452; and, "Treatment of Fibroid Tumours of the Uterus." *Journ. Amer. Med. Assoc.*, May 21st, 1904). As the usual ratio between epithelioma of the cervix and adenocarcinoma of the corpus uteri is probably as 10 to 1, the fact that in this series six cases of cancer of the body of the uterus were encountered, as compared with four cases of cancer of the cervix, led to the belief that the irritation in the uterus and more particularly in the endometrium, or changes in the nutrition of the uterus arising from the presence of fibroid tumours in the uterus, bear a causal relation to the development of cancer.

The usual ratio of epithelioma of the cervix to adenocarcinoma of the corpus uteri is given by Cullen (Cullen, T. S. "Cancer of the Uterus." N.Y., 1900, p. 3) as 4 to 1. That is, he examined 35 cases of cancer of the corpus uteri and 147 cases of cancer of the cervix, in the gynæcological service at the Johns Hopkins Hospital.

Winter (Winter, Georg. "Die malignen und benignen Degenerationen der Uterusmyome." "Zeitschrift f. Geburtshülfe und Gynäkologie," Bd. lvii., Ht. i., 1906, p. 10) gives the ratio as 1 to 15. That is, in 2,331 cases of cancer of the uterus compiled from various German authors and including 210 cases of his own, Winter found one carcinoma of the body of the uterus to every fifteen carcinomata of the cervix.

Sinclair (Sinclair, W. J. "Malignant Diseases of the Uterus." *Allbutt and Playfair's System of Gynæcology*, 1896, p. 656) states that from 2 to 3 per cent. of all cases of cancer of the uterus are instances of cancer of the fundus.

Williams (Williams, W. Rogers. "Uterine Tumours, their Pathology and Treatment." London, 1901, p. 196) states that of 160 consecutive cases of cancer of the uterus coming under his observation, only 4, or 1 in 40, were cancers of the corpus uteri. He states that the reason some other authorities give a higher ratio is that their estimate is based upon patients who are operated upon, instead of upon the ratio as it exists when the patients consult the physician; that there are far more cases of cancer of the cervix unfit for operation than of cancer of the corpus uteri.

It is evident that there is a difference of opinion as to the usual ratio between cancer of the cervix and cancer of the body, but as met with in the operating room it is probable that a mean between the statement of Cullen and that of Winter is approximately correct, and may be assumed to be 10 to 1.

In the total series of 2,274 cases there have been 43 cases of adenocarcinoma of the body of the uterus (1·8 per cent.) and 16 cases of cancer of the cervix (·7 per cent.).

In my own series of 337 cases there have been 9 cases of cancer of the corpus (2·6 per cent) and 5 cases of cancer of the cervix uteri (1·4 per cent.).

In the last 100 cases of fibroid tumours operated upon by myself by abdominal hysterectomy there were five cases of adenocarcinoma of the body of the uterus, one case of epitheliomatous infiltration of a fibroid tumour arising from adenocarcinoma of the corpus uteri by metaplasia, and two cases of cancer of the cervix, which makes six cases of cancer of the body of the uterus to two of cancer of the

cervix, and which constitutes 8 per cent. of fibroid tumours complicated by cancer of the uterus—a very striking experience.

In view of the usual ratio of frequency existing between cancer of the cervix and cancer of the body of the uterus, the conclusion seems to be inevitable that the development of adenocarcinoma of the corpus uteri is favoured by the presence of fibroid tumours in the uterus. With the usual ratio, for 43 cancers of the body of the uterus there should have been 430 cancers of the cervix instead of 16 as reported.

In addition to the 2,274 consecutive cases which have been collected for the study of all the degenerations and complications of fibroid tumours, I have been able to collect 2,606 additional cases for the study of the relation of fibroid tumours of the uterus to carcinoma and sarcoma of that organ.\*

Winter (*loc. cit.*, p. 11) has studied 1,607 consecutive cases of myoma from the clinics of Hofmeier, Fehling and himself, in which there were twenty carcinomata of the corpus uteri, or 1·2 per cent.; also 1,270 cases of myoma from the clinics of Hofmeier, Freund and himself, in which there were twenty-five cases of carcinoma of the cervix, or 2 per cent.

In order to reduce these figures to a percentage basis for statistical uses, as Winter has studied a different number of cases having cancer of the body than of cases having cancer of the cervix, we will take the liberty of assuming that if in 1,270 cases of fibroid tumours there were 25 cancers of the cervix, in 1,607 cases of fibroid tumours there would be 31 cancers of the cervix. That this is practically correct is indicated by the fact that if the statistics of Hofmeier and Winter, which figure in both lists, are taken, omitting those of Freund and Fehling, the proportion would be, if in 1,198 cases of fibroid tumour were found 24 cases of cancer of the cervix, in 1,607 cases there would be found 32 cancers of the cervix.

In Kelly's clinic at the Johns Hopkins Hospital, in 999 cases of fibroid tumour of the uterus (private communication), in which myomectomy was performed 308 times and hysteromyomectomy 691 times, cancer of the corpus uteri was found in 12 cases and cancer of the cervix was found in 16 cases. Adding the 2,274 cases of the original table to the 999 from Kelly's clinic and the 1,607 from Winter's paper, gives a total of 4,880 cases of fibroid tumour of the

\* There is a partial reduplication of cases in this paper. Thus Watt-Keen's 300 cases were reported from Hofmeier's clinic, and Winter's paper includes 445 cases from Hofmeier's clinic. It is not apparent how much the reduplication actually is, as no dates are given.

uterus in which cancer of the cervix was present in 63 cases and cancer of the corpus uteri was present in 75 cases, making a total of 138 cases of cancer in the 4,880 cases, or 2·8 per cent. Subdividing these, we find that cancer of the cervix was present in 1·29 per cent., and cancer of the corpus uteri in 1·54 per cent. It is interesting to compare these figures with my personal experience in 337 cases, in which cancer of the cervix was present in 5 cases and cancer of the corpus uteri in 9 cases; and with the last 100 abdominal hysterectomies for fibroid tumours performed by myself, in which cancer of the cervix was present in 2 cases and cancer of the body was present in 6 cases. This indicates, I believe, that in the total series, cases of cancer have been omitted from the table because of the influence of tradition. When the gynaecologist has operated for cancer the presence of a fibroid tumour has not been recorded, and thus the ratio between fibroid tumours of the uterus and cancer appears in the table to be less than is actually true.

Piquand draws the following conclusions from a study of the literature (Piquand, G. "Fibromes et Cancers Utérins." *Annales de Gynécologie et d'Obstétr.*, July, Aug., Sept., 2nd série, 1905, Tome ii., p. 393):—Primary carcinoma developing in the midst of a fibroma is possible, though rare. He has collected 24 cases, most of which appear to be indisputable. He explains this development of carcinoma on the ground that there has been an inclusion of mucous membrane from the uterine mucosa which has grown into the tumour, and from which the primary carcinoma has developed. In other words, he attributes the development of carcinoma in the fibroid itself to the processes which take place in the development of adenomyoma.

Under the title of the co-existence of fibromyomata and cancer (*loc. cit.*, 583) he discusses (1) the co-existence of fibromyomata and cancer of the uterine body, and (2) the co-existence of fibromyomata and cancer of the neck of the uterus. He has collected 179 cases of the co-existence of fibromyomata and cancer of the corpus uteri. He states that cancer of the corpus uteri is eight or nine times more frequent in women having fibroid tumours than in those without this lesion, and draws the same conclusion from his study of the literature that I had drawn, namely, that fibromyomata predispose to the development of cancer of the corpus uteri. He also believes that the presence of a fibroid tumour favours the development of cancer of the cervix.

As Piquand's monograph is not based upon the study of a consecutive series of cases, it is only of relative value for the purposes

of this paper with its strict limitations, but his conclusions support those to which I have been driven from the study of more definite material.

Klein, in a study of 406 uterine myomata (Klein, Gustav. "Blutuntersuchungen bei Unterleibsleiden der Frauen besonders bei Uterusmyomen." *Zentral. für Gynäkol.*, 1905, No. 31, p. 969), reports that in 206 cases operated upon there existed as a complication either sarcoma or cancer of the uterus in 10 cases, or 4·85 per cent.

One of the recent converts to the view that the presence of a fibroid tumour in the uterus predisposes to the development of cancer is Cullen, of Baltimore (Cullen, Thomas S. "Immediate Examination of Uterine Mucosa and Myomatous Nodules after Hysteromyomectomy to Exclude Malignant Disease." *Journ. Amer. Med. Association*, March 10, 1906, Vol. xlv., p. 695). He states that the paper by myself first aroused gynæcologists to an appreciation of the danger of allowing myomata to remain year after year without operative interference, and adds that in going over the large number of myoma cases in the Johns Hopkins Hospital clinic, he has been surprised at the number of instances in which myomata are associated with cancer either of the body or of the cervix, and also of the relatively frequent occurrence of sarcomata developing in myomatous tumours. Cullen was prepared to accept the views which I advocated because of his experience as a pathologist, which taught him that fibroid tumour and cancer are frequently associated. In 1904, in discussing McDonald's paper before the Philadelphia Obstetrical Society, he supported my position, and stated that the material at the Johns Hopkins Hospital, embracing about 1,000 fibroid tumours, taught the same lessons which I had drawn from my own experience and from the literature.

Winter (*loc. cit.*, p. 11) in his last article commits himself to the view that there is a distinct connection between fibroid tumours of the uterus and carcinoma of the corpus uteri, and that the carcinoma probably results from the hyperplastic condition of the endometrium existing in consequence of the myoma. Already in 1898 (Winter, Georg. "Die bösartigen Neubildungen des Uterus." *Veit's Handbuch der Gynäkologie*, B. iii., 2nd half, 1899, p. 245) he had drawn attention to the fact that carcinoma of the uterus in combination with fibroid tumours exists in the ratio of 23 cases of cancer of the corpus uteri to 13 of the cervix. At that time he had drawn no conclusion from these facts. He stated that the relation of the two tumours is uncertain and that one could only speculate about it, and that the solution of the problem must be left to the future.

From the study of the 4880 consecutive cases of fibroid tumour of the uterus in their relation to cancer of that organ, the conclusion seems inevitable that fibroid tumour of the uterus predisposes to the development of cancer of the corpus uteri. Were this not true, with the 75 cases of cancer of the corpus uteri existing in this series there should have been found 750 cases of cancer of the cervix, upon an average calculation. Even taking the minimum estimate of Cullen, there should have been 300 cases of cancer of the cervix, whereas but 63 were present. To explain this as an accidental circumstance in such a large series of cases (more especially from the standpoint of my own experience, which speaks even more strongly than the total series) would be an assumption so far-fetched as to be beyond reasonable bounds. It is my opinion that when this subject is studied in the future and the presence or absence of fibroid tumours, no matter how small they may be, is recorded in connection with all operations upon the uterus when cancer exists in that organ, the data secured will offer stronger evidence than is true of this particular series. The number of cancers in this series is doubtless far below the actual number, because of the influence of tradition in bringing about the failure to record the presence of a fibroid owing to its supposed relative unimportance when complicating cancer.\*

#### SARCOMA AS A COMPLICATION OF FIBROMYOMATA UTERI.

Sarcoma of the uterus was present in 34 of the 2,274 women, or 1.4 per cent. In the 337 cases operated upon by myself, there were two cases of sarcoma, and in the last 100 operations there was no case of sarcoma.

It is known by pathologists that a fibroid tumour may undergo a sarcomatous degeneration, that is, that the fibroid tumour itself may be converted into a sarcoma. On the other hand, certain clinicians believe that many cases in which this degeneration is supposed to have occurred were really sarcomata from the beginning.

Winter (*loc. cit.*, p. 19) reports two series of cases with reference

\* A statistical study of the relative frequency of cancer of the cervix and cancer of the body of the uterus in women admitted to hospitals, comparing those having fibroid tumours of the uterus with those who have not, would throw definite light on the question of the influence of fibroid tumours upon the development of cancer of the corpus uteri and cancer of the cervix. A study of this percentage with the percentage of cancer in women in general, as shown by the vital statistics of cities and the census, would be misleading, for the reason that only selected cases of cancer are admitted to hospitals. The advanced cases not admitting of operation do not appear in hospital statistics as a rule, but naturally all of them figure in the death list of bureaus of vital statistics.



to the relation of fibroid tumours to sarcoma. The first consists of 500 cases in which only the suspicious points were examined microscopically. In this series sarcoma was found in 3·2 per cent.; in the second series, consisting of 253 cases, where sections were taken systematically from different areas, sarcoma was found in 4·3 per cent. The average for the entire series is 3·6 per cent. His own cases added to those of Fehling and Hofmeier make 1,743 cases in which sarcoma was found 46 times, or 2·7 per cent. Winter believes that if myomata were examined systematically, sarcoma would be found in about 4 per cent. of all cases.

Cullen (*loc. cit.*, p. 695) insists upon the necessity for an immediate examination of the uterine mucosa of all myomatous nodules after hysteromyomectomy in order to exclude the presence of sarcoma as well as of carcinoma. In my own series of 337 cases, there were only two cases of sarcoma. Combining the 2,274 consecutive cases with 1,743 cases from Winter's paper a total of 4,017 cases is furnished in which sarcoma was present 81 times, or 2 per cent. This experience should be taken in connection with the experience of Winter, who shows that when sarcoma was diligently searched for by examining all tumours contained in a uterus, it was found in 4·3 per cent.; whereas, when looked for in the customary way by examining only one tumour and that the one which was under suspicion, it was found in 3·2 per cent.

#### THROMBOSIS, EMBOLISM AND PHLEBITIS, AS COMPLICATIONS OF FIBROMYOMATA UTERI.

Thrombosis, embolism and phlebitis are three complications which are encountered more frequently in connection with fibroid tumours than with any other known condition. All three are much more common after operation for fibroid tumours than in the natural history of the disease.

A striking case of phlebitis occurring with a fibroid tumour before operation has been observed by myself in the practice of Dr. Isaac Leopold. The patient was suddenly seized with a severe peritonitis. After the subsidence of the peritonitis, a phlebitis of the veins in the left side of the neck appeared extending below the clavicle and into the axilla. Operation was postponed until the evidence of phlebitis had disappeared. At the operation the cause of the peritonitis was found to be a pedunculated fibroid tumour which had undergone torsion of its pedicle. The patient progressed well after the operation until the third week, when she developed symptoms of embolism in the floor of the fourth ventricle and died

two days later, the muscles of deglutition being paralyzed. At least one other case of phlebitis secondary to inflammatory changes in a fibroid tumour without operation has been observed by the writer.

Baldy states that of nineteen patients who died suddenly after operations in his hands (Baldy, J. M. "The Mortality in Operations upon Fibroid Tumours of the Uterus." *Amer. Journ. Obstet.*, 1905, vol. 52, No. 3, p. 370), thirteen were in cases of fibroid tumour, whereas the cases of fibroid tumour numbered but 366 out of a total of 3,413 patients. The sudden deaths were tabulated as cardiac 13, pulmonary 4, cerebral apoplexy 2. He holds that fibromyoma of the uterus is not a local disease, but that the process is practically a general one, in that it involves other organs, how many and to what extent and how early are unknown. He believes in the prompt removal of fibroids to avoid these general complications.

Schenck (Schenck, Benjamin R. "A *Résumé* of Forty-eight Cases of Post Operative Thrombosis." *New York Med. Journ.*, Sept. 6th, 1902, p. 401) states that post operative thrombosis of the veins of the lower extremities occurred 48 times in a series of 7,130 women operated upon in the gynæcological department of the Johns Hopkins Hospital. The operations in the affected cases were as follows:—

Perineorrhaphy .....	4
Hysteromyomectomy and myomectomy .....	19
(Of the 7130 women 7·27 had fibroid tumours)	
Ovariectomy .....	9
Hysterectomy for carcinoma .....	5
Suspensio uteri .....	3
Suspensio uteri and perineorrhaphy .....	4
Hysterectomy for pelvic inflammatory disease.....	1
Miscellaneous .....	3

This report of Schenck's is quite in accord with that of Baldy and with my own experience. The causes of thrombosis, embolism and phlebitis are by no means definitely known. There is no doubt that infection is the cause of thrombo-phlebitis in a definite proportion of cases, but the fact that thrombosis and phlebitis occurred 19 times in fibroid tumours and only once in pelvic inflammatory diseases is sufficient evidence that there are other factors than infection in the production of these allied conditions. Anæmia, increase in the number of white blood cells and blood plaques and changes in the relation of the chemical constituents of the blood, slowing of the blood stream, abnormalities in the walls of the veins and traumatism,

are all factors. The ultimate solution of this problem must be worked out on the lines of general pathology rather than by looking for a local cause. It is evident, however, that fibroid tumours in their development bring about such changes in the blood and circulation as to favour the development of thrombosis, embolism and phlebitis, and this fact constitutes one of the indications for the early removal of fibroid tumours.

#### FIBRO-CYSTS OF THE UTERUS AS A COMPLICATION OF FIBROMYOMATA UTERI.

In the total series of cases there were 58 fibro-cysts of the uterus, or 2·5 per cent. It is well recognized that the larger fibro-cysts rapidly increase in size and fluid contents, and cause a fatal termination in a manner similar to that caused by ovarian cysts. The natural history of the smaller cysts is not so definitely known, but there is every reason to believe that when cystic degeneration once occurs the fluid contents increase, and the small fibro-cyst becomes a large one. There is no doubt also that in a definite percentage of cases myxomatous degeneration ends in cystic degeneration. In another group of cases the termination is in necrosis, which is also true of œdema of fibroids.

Bland-Sutton holds (Bland-Sutton, J. "Essays on Hysterectomy." London, 1904, p. 7) that myxomatous degeneration of a fibroid tumour, so described, is not so in fact, but that it is a primary condition which seems to bridge the interval between true fibromyomata and sarcoma of the uterus. He appears to be alone in ascribing so serious a nature to myxomatous degeneration.

Winter (*loc. cit.*, p. 55) reports that Hofmeier in 255 fibroid tumours removed by operation found 8 fibro-cysts, or 3·2 per cent. Cullingworth found 5 fibro-cysts in 100 operations, or 5 per cent. If myxomatous degeneration, œdema and hyaline degeneration were classed with the cystic degenerations, in which these morbid conditions frequently result, the percentage would naturally be far greater.

#### ANÆMIA AS A COMPLICATION OF FIBROMYOMATA UTERI.

Having considered the more important degenerations and complications arising in the uterus and tumour itself in which it is feasible to draw fairly definite deductions as to the mortality which would ensue without operation, we will now consider a number of the associated conditions the result of fibroid tumours.

Hæmorrhage resulting in anæmia is one of the most common results of fibroid tumours. According to Winter (Winter, Georg.

"Die Wissenschaftliche Begründung der Indikationen zur Myomoperation." *Zeits. für Geburts. und Gynäkol.*, Bd. lv., p. 59), it occurs in about two-thirds of the cases of myoma, most frequently in cases of submucous fibroids. My own experience would not indicate so large a percentage, but in cases of submucous fibroids it is always present, and is often very profuse, leading to profound anæmia. I have reported two cases of this type. In one, the hæmoglobin was reduced to 10 per cent., the erythrocytes to 2,325,000. This patient was curetted to control the bleeding, and later had a hysterectomy, and made a good recovery. In the other, the hæmoglobin was reduced to 15 per cent. and the erythrocytes to 1,016,000. This patient also made a good recovery.

Grave anæmia is a serious condition which produces profound invalidism while it lasts, and sometimes it is fatal or impossible to cure. A fatal result due to hæmorrhage is rare. Pellanda (Pellanda, C. "*La Mort par Fibromyomes Utérins*," Paris, 1905), in a study of 171 cases of death from fibromyomata without operation, states that in 6·4 per cent. of fatal cases death is due to hæmorrhage. The more usual result of grave anæmia is that, finally, the patients are operated upon and their unfavourable condition tends to swell the mortality of operation.

The relation of anæmia due to hæmorrhage from fibroid tumours to degeneration of the heart and secondarily to degeneration of the kidneys is well recognized. These secondary results of fibroid tumours lead to a fatal termination in a definite percentage of cases without operation, and the same condition with the changes in the circulation due to pressure of the tumour constitute the chief underlying causes of thrombosis and embolism following operation, which would be avoided by the early removal of the tumours.

#### INJURIOUS PRESSURE UPON THE URINARY ORGANS BY FIBROID TUMOURS.

Symptoms referable to the bladder are quite common in the life history of fibroid tumours. In quite a number of women upon whom I have operated for fibroid tumour, the cause of their seeking advice was that they were unable to void urine. In some of them this was the only symptom complained of. In other cases, through disturbances of the circulation and through infection, very marked bladder symptoms may be present, and cystitis may occur. In my experience this has been especially true of fibroids which had undergone calcification. In some cases the pressure has been upon the bladder. As is well known, irritation in the lower end of the ureter

causes an intense desire to urinate. In one case coming under my observation an old lady of sixty-seven years, after a life of invalidism extending over thirty-two years, was driven to operation because of the torments she suffered from inability to hold her urine more than a few minutes. A calcareous fibroid had made such pressure upon the right ureter as to cause destruction of the right kidney; and thus the fibroid caused her death at sixty-seven, after she had endured her invalidism from the age of thirty-five in the vain hope of a cure through atrophy following the menopause.

Knox (Knox, J. H. M. "Compression of the Ureters by Myomata Uteri." *Amer. Journ. Obstet.*, vol. xlii., No. 3, Sept. and Oct., 1900, pp. 364 and 496) reports 25 cases of ureteral obstruction by means of fibroid tumours of the uterus. Ten of these occurred in Kelly's clinic at the Johns Hopkins Hospital, and 15 were collected from other sources. He concludes that some compression of the ureters is produced by a large proportion of all large fibroid tumours. This is a question which has received relatively little study, because, as a rule, the cases (except those found at autopsy) have not been diagnosed. There is no doubt, however, that degenerative changes in the kidneys are caused by pressure upon the ureters as well as by cardio-vascular degeneration.

#### RENAL COMPLICATIONS OF FIBROMYOMATA.

Renal complications in the form of dilatation of the ureters from pressure and nephritis are more common than is usually believed. In 30 per cent. of Webster's cases (*loc. cit.*) there was noted one or more of the following indications of renal involvement: deficient amount of urine or urea, albumen, casts, and œdema of the feet. Webster believes that the factors concerned in the production of these renal disturbances are probably identical with those causing the cardiac changes in connection with myomata of the uterus.

Dilatation of the ureters and hydronephrosis were mentioned four times in the series of 2,274 cases. Any other cases occurring in this series were not observed at operation or at autopsy. The literature, however, contains numerous references to this condition found at autopsy.

Pellanda (*loc. cit.*) states that in the natural history of the disease death from compression of the abdominal and pelvic viscera occurs in 25 per cent. of the fatal cases. Of 44 fatal cases from this cause, the intestine was involved in 20, the ureter in 13, and in 11 the uterus, vagina, bladder or abdominal wall, was perforated.

## CARDIO-VASCULAR CHANGES DUE TO FIBROMYOMATA.

The relation of fibroid tumours to degenerative changes in the myocardium and in the blood-vessels is a problem which as yet is not definitely settled. The occurrence of brown atrophy and of fatty degeneration of the heart, of fibroid changes in the arterioles, of secondary degenerations in the kidneys, and of changes in the circulation, blood-vessels and blood, leading to thrombosis and embolism, have all been ascribed to the influence of fibroid tumours upon the economy. The evidence is satisfactory that all these secondary changes do occur, but the percentage and mode of their occurrence are not definitely known.

Hofmeier (Hofmeier, M. "Zur Lehre vom Shock (Ueber Erkrankungen der Circulations-Organe bei Unterleibsgeschwülsten)." *Zeits. für Geburts. und Gynäkol.*, 1885, Bd. xi., p. 366); Fenwick, Bedford. "On Cardiac Degeneration from the Pressure of Abdominal Tumours." *The Lancet*, Vol i., May 26, 1888, p. 1015); Strassman and Lehmann (Strassman, P., and Lehmann, F. "Zur Pathologie der Myomerkrankung." *Archiv für Gynäkol.*, Bd. lvi., H. 5, p. 503), all have discussed this question *in extenso*.

Boldt in a study of this subject (Boldt, H. J. "Uterine Fibromyomata and Visceral Disease." *New York Med. Journ.*, Oct. 28, 1905, Vol. lxxxii., No. 2, pp. 887—895), covering 79 cases of fibromyomata, states that in 37 patients, or nearly 47 per cent., some circulatory disturbance was noted. In many of the patients the symptoms might have been functional in their nature. One patient died of angina pectoris. Five of the patients died after operation. Death in three of the five patients was clearly due to cardio-vascular degeneration.

Pellanda (*loc. cit.*) states that death in the natural course of fibromyomata occurred from thrombosis of the pelvic venous sinuses and pulmonary embolism, cardiac lesions and sudden syncope, in 11.1 per cent. of the cases.

From my own experience I do not believe that cardio-vascular degeneration plays a very important rôle in producing fatal results in fibromyomata of the uterus either in the natural history of the disease or after operation except in neglected and late cases. The changes are secondary, as a rule, to anæmia from hæmorrhage or to malnutrition either by hæmorrhage or by disturbances of digestion malnutrition superinduced either by hæmorrhage or by disturbance of digestion from pressure of the tumours. Interference with the circulation by pressure of the tumours also plays its rôle in the

production of thrombosis, phlebitis and embolism. If patients were operated upon early, or if when referred for operation late they were well prepared before operation, the mortality from cardio-vascular changes would be much diminished. There is no doubt that the occurrence of thrombosis, phlebitis and embolism is favoured by the anæmia and cardio-vascular degenerations resulting from fibroid tumours, and thus adds to the morbidity of operations for fibroid tumours. Fortunately only a small percentage of cases of thrombosis or of phlebitis end fatally either by embolism or by septicæmia.

Winter (Winter, Georg. "Die wissenschaftliche Begründung der Indikationen zur Myomoperation." *Zeits. für Geburts. und Gynäkol.*, Bd. lv., p. 109) has studied a series of 266 cases of fibroid tumours from the standpoint of the relation of these growths to heart lesions. He did not trust to his own examination, but sent each of the patients to a skilled physician for examination. A summary of the results follows:—

- (1) Heart entirely normal; clear tones, normal outline 163 cases, 60%
- (2) Murmurs (78) and impure tones (3) were observed 81 cases, 30%

The significance of the murmurs was ascribed to:

Anæmia .....	52
Apparent anæmia .....	16
Arterio-sclerosis .....	6
Neurasthenia .....	2
Adipositas cordis .....	2

- (3) Dilatation and hypertrophy (cases due to valvular disease and myocardial alterations excluded)... 16 cases, 6%  
14 cases of dilatation; majority due to anæmia; some could be accounted for by nephritis, arterio-sclerosis, emphysema.
- (4) Cardiac insufficiency ..... 3 cases, 1%  
Mitral regurgitation ..... 1  
Mitral stenosis ..... 2
- (5) Myocardial disease ..... 3 cases, 1%

This contribution of Winter is especially important as showing the percentage of cases having cardiac changes secondary to fibroids, presumably in the group of cases capable of walking to a physician's office.

#### THE INFLUENCE OF THE MENOPAUSE UPON DANGERS ARISING FROM FIBROID TUMOURS.

The classical position was that if a woman would but endure the sufferings entailed upon her until the menopause, the tumour would undergo atrophy and disappear, the woman thus making a spontaneous recovery. At this time it is scarcely necessary to say more than that this teaching had but a small basis in fact. It is true that

some fibroid tumours undergo atrophy after the menopause and become smaller, but I am not personally acquainted with a single authentic case in which a fibroid tumour has entirely disappeared after the menopause. Those mentioned in the literature which I have investigated have belonged to this category; that is, the statement is that they have become very much smaller or that the reporter has been told by somebody else that they have disappeared. On the contrary, it is very well known that the dangers arising from fibroid tumours are much greater at and after the period of the menopause than in women under forty. This fact has been especially emphasized by Bland-Sutton (*loc. cit.*) amongst others. The point has not yet been worked out definitely, and therefore should particularly engage the attention of gynecologists at this time, but from my own experience I am inclined to believe that cancer of the body of the uterus is as apt to occur in connection with the small, partly atrophied tumours found after the menopause as in tumours of larger size. It is well recognized that instead of undergoing atrophy at the time of the menopause a considerable proportion of fibroid tumours grow very much more rapidly after than before that period. Necrosis, cancer, sarcoma and cystic degenerations, are all more common after forty than before it. The tumours which become calcareous later in life produce injurious pressure symptoms upon the urinary organs and bowels. Calcareous tumours are especially liable to undergo necrosis from defective blood supply. The cardiovascular degenerations arising from fibroid tumours are also much more common after forty than before it.

In 187 women operated upon for fibroid tumours by myself (Noble, Charles P. "The Complications and Degenerations of Fibroid Tumours of the Uterus as Bearing upon the Treatment of these Growths." *Journ. Brit. Gynæc. Soc.*, 1901, vol. xvii., No. 67, p. 179) the following were the ages classified in decennial periods:—

Under 20 .....	1
Between 20 and 30 .....	6
Between 30 and 40 .....	77
Between 40 and 50 .....	76
Between 50 and 60 .....	20
Between 60 and 70 .....	7

In the last 100 women operated upon for fibroid tumours by abdominal hysterectomy, the ages were as follows:—

20 to 30 .....	2
30 to 40 .....	36
40 to 50 .....	45
50 to 60 .....	14
60 to 70 .....	7



Thus of 287 women who were driven to operation because of fibroid tumours, 8, or 16 per cent., were upwards of fifty years of age. When it is considered that most fibroid tumours are removed before women reach the age of forty-five, it is striking evidence of the fact that they are prone to produce grave disorders in women who have passed the menopause.

As illustrative cases, I might refer to the one already reported, in which a woman of sixty-seven was driven to operation from intolerable bladder symptoms after enduring invalidism and semi-invalidism from the age of thirty-five.

I have also reported the case of a physician's wife who had suffered from the age of thirty-five to fifty-three from uterine hæmorrhages before the menopause was established. Subsequently her health improved, but she was never a vigorous woman. When about seventy-five years of age, after a rough drive on a country road, the tumour became necrotic, an abscess developed which ruptured into the bowel, a drainage operation was performed, but the patient died of sepsis.

A striking case was that of Miss M., aged sixty-three, referred to me by the late Dr. Pugh. Her family and personal history presented nothing of a special nature. She passed the menopause at the age of forty-five without incident. She had been relatively well until nine months before consulting me, when she had had difficulty with the bladder and sometimes incontinence. Subsequently she had been troubled with leucorrhœa in increasing quantities and with some odour. For some weeks before she came to me the leucorrhœal discharge had been stained with blood. Upon examination a virginal and senile vagina was found (Noble, Charles P. "Report of a Case of the Invasion of a Fibromyoma of the Uterus by an Adenocarcinoma, which by Metaplasia had assumed the Appearance of a Squamous-celled Carcinoma." *Amer. Journ. Obstet.*, Vol. xlix., No. 3, p. 306), the cervix was small and normal, and the uterine body was much enlarged and irregular in shape, suggesting fibroid tumour. A clinical diagnosis of degenerating tumour or a fibroid tumour complicated by an adenocarcinoma of the corpus was made. A hysterectomy was advised; curettage was performed, as a preliminary, for diagnostic purposes, and no evidence of cancer was found; hence a diagnosis of degeneration of a fibroid was made. Supravaginal hysterectomy was performed, and the uterus was cut open by an assistant, when the endometrium was found smooth and apparently uninvaded by any growth. Later the pathologist reported a squamous epithelium of the fibroid, and after further study made the

diagnosis indicated by the title of the paper in which the case was first reported. In other words, a fibroid tumour quiescent in the uterus for years was the final cause of the development of cancer at the age of sixty-three. The operation was performed February 18th, 1903, and although the cervix was left, there has been no recurrence.

Another instructive case is that of Mrs. H., aged forty-nine, who consulted me in 1891 complaining of neuralgic pains and the nervous symptoms of the menopause, which had existed for six months. Her menstruation was not excessive, although it came every three weeks. She was very pale and in poor health. Upon examination a large nodular fibroid tumour was found filling the pelvis and extending half way to the umbilicus. At that time I advised expectant treatment and prescribed tonics, and gradually her nutrition improved. In 1902 she consulted me to thank me for the advice I had given her in 1891 and to say that the statement I had made at that time, that the tumour would become smaller, was true, because from her standpoint it had disappeared. She refused examination. She consulted me again (May 23rd, 1904), and upon examination I found a tumour pretty well filling the pelvis. She had lost thirty-seven pounds in the preceding seven months, and was suffering from nausea, vomiting and partial obstruction of the bowels. There was every reason to believe that she had cancer of the uterus, with secondary involvement of the intestines. She died later in the summer.

#### SPONTANEOUS DISAPPEARANCE OF FIBROID TUMOURS AFTER PREGNANCY.

There is much more evidence of the spontaneous disappearance of fibroid tumours in a small percentage of cases after pregnancy than is true of their disappearance after the menopause. Thus Doran (Doran, Alban. "On the Absorption of Fibroid Tumours of the Uterus." *Trans. Obstet. Soc. of London*, Vol. xxxv., 1893, p. 250) reports thirteen cases of the spontaneous disappearance of fibroid tumours associated with pregnancy. In eleven it is stated that the fibroids entirely disappeared, and that in two they partly disappeared. Doran says, although many of the cases reported may have been based on an error in diagnosis, nevertheless so many cases have been recorded by experienced authorities that there can be no doubt that fibroid tumours of the uterus of considerable size sometimes disappear spontaneously before the menopause. In a study of the subject in 1904, Doran expresses himself even more sceptically concerning the spontaneous disappearance of fibroids (Doran, Alban. "The

Disappearance or Absorption of Fibroids before the Menopause." *Journ. of Obst. and Gyn. of the Brit. Empire*, August, 1904, Vol. vi., p. 141). He refers repeatedly to errors of diagnosis and to the possibility of mistaking inflammatory masses for fibroids. He admits the possibility of the disappearance of fibroids, but says, "Evidence as to their total or almost complete disappearance before the menopause is very scanty and unsatisfactory."

Olshausen (Olshausen, Robert. "Myom und Schwangerschaft." *Veit's Handbuch der Gynäkologie*, 1897, Bd. ii., p. 767) states that myomata, as a rule, undergo considerable diminution in size after the puerperium. In most cases they do not become any smaller than they were before pregnancy; in others, the shrinkage goes farther. The entire disappearance of fibroids during the puerperium has been reported by so many trustworthy authorities that it can be no longer doubted.

I have never observed the entire disappearance of a fibroid tumour, either after pregnancy or the menopause, nor has any case been reported to me as having been observed by any of my acquaintances. Therefore, while it is probable that fibroid tumours have disappeared spontaneously both after pregnancy and after the menopause, such a termination is one of the rare exceptions in the history of these growths, and is never to be anticipated in any particular case.

#### RECENT LITERATURE OF FIBROID TUMOURS OF THE UTERUS.

For the purpose of this paper, based as it is upon the exact study of a consecutive series of cases, much of the recent literature, in itself valuable, could not be employed; hence, in this connection I shall refer to a few of the papers which have especially impressed me among the many consulted in the hope of finding consecutive series of cases to add to the present table of 2,274 cases.

Gordon, of Maine, in 1893, was one of the first to advocate the early removal of fibroids in cases which produced symptoms, and to make the claim that a very large percentage of fibroids do produce symptoms (Gordon, S. C. "Dangers and Complications of Uterine Fibroids." *Trans. Amer. Gynec. Soc.*, 1893, p. 91). In 1895 (Gordon, S. C. "Further Experience and Observations in Hysterectomy for Fibroids." *Trans. Amer. Gynec. Soc.*, 1895, p. 30) he again emphasized this belief, and in various discussions which have taken place since that date he has always maintained the correctness of the teaching that almost all fibroid tumours should be removed, certainly all fibroids which were causing symptoms when the patient

consulted the physician, and has repeatedly pointed out that women do not consult a physician unless fibroid tumours are producing symptoms. In his first paper he calls especial attention to the degenerations and complications which are present in a large percentage of fibroid tumours.

Richardson, of Boston, in a suggestive paper (Richardson, Maurice H. "Uterine Fibroids." *Boston Med. and Surg. Journ.*, 1904, Vol. cl., No. 2, p. 39), states: "Whenever we postpone operation on uterine fibroids, no matter how benign these tumours may seem, we are running a risk beside which the dangers of an operation are but trivial." Richardson believes that the risk of operation in skilful hands is less than the risk of overlooking carcinoma and sarcoma under the mistaken diagnosis of an uncomplicated fibroid.

Lewis (Lewis, Henry F. "Malignancy in Uterine Myomata." *Amer. Journ. Obstet.*, New York, October, 1905, Vol. lii., No. 4, pp. 481—494) says that an etiological relation between adenocarcinoma of the corpus uteri and fibroma seems probable, although the exact relationship cannot be stated. "I would like to make it a working rule that every fibroid of the uterus should be operated upon as soon as the diagnosis is made, except small ones whose only symptoms are slight discomfort due to their mechanical presence in the pelvis. These should be excepted only when the patient can be under proper surveillance and is willing to undergo examination at intervals of a few months and to report at once upon the occurrence of noticeable symptoms of any kind." Lewis's conclusions are based largely on a study of the literature.

Eastman (Eastman, Thomas B. "Innocent Fibromyomata of the Uterus." *Journ. of the Amer. Med. Assoc.*, October 21, 1905, Vol. xlv., No. 2, pp. 1238—1243), in a study of the literature, and more particularly a study of his own experience, embracing 169 cases, reports 5 cases which illustrate the impracticability and often the impossibility of making a diagnosis of certain conditions existing in fibroid tumours prior to their removal; also 2 cases in which women were not operated upon when first examined, as they presented no special symptoms at the time—both of these patients died later without operation, for when seen again they were in such condition that operation was impracticable. The first patient had a fibroid tumour extending to the umbilicus, with few symptoms. She refused operation because the tumour was giving no trouble. A year later she presented herself, being eager for operation, but in the meantime she had developed fatty degeneration of the heart, and operation was impracticable; six weeks later she died. The second patient

presented herself not because of suffering, but because having a large abdomen her neighbours questioned her chastity. She preferred to wait until cool weather before being operated upon. Soon after, she was seized with a chill, high temperature, etc., and died. Autopsy showed necrosis. The third patient had some hæmorrhagic symptoms and a tumour equal in size to a cocoa-nut. It was not considered a complicated case. Upon operation and examination necrobiosis was found. The fourth case was that of a woman with a large tumour suffering from hæmorrhage and pressure symptoms, but able to support herself and a large family as a washerwoman. A diagnosis of uncomplicated fibroid tumour was made. After the removal of the tumour by operation, microscopic studies showed sarcomatous degeneration. The fifth patient had a tumour which she believed was giving her no trouble, although her general health was failing. After operation a microscopic study showed adenocarcinoma of the corpus uteri. His seven cases all present one common characteristic—the lack of any symptom which would indicate a pathological lesion other than the tumour itself. They all belong to the class in which the expectant treatment is advised by those who consistently hold to the classical position; occurring in a short series of cases, they offer strong evidence of the unwisdom of this position. Eastman concludes by saying: "I am convinced that all fibromyomata should be removed unless there should be concurrent conditions which render the operation inadvisable."

Bovée (Bovée, J. Wesley. "The Treatment of Fibroid Tumours of the Uterus." *Amer. Journ. Obstet.*, New York, August, 1905, Vol. 52, No. 2, pp. 203—209), after discussing the teachings of the recent literature upon fibroids, says: "I believe the scientific treatment of fibroid tumours should always be extirpation." Bovée is convinced that there is a causal relation between the presence of a fibroid tumour in the uterus and the development of cancer of the corpus.

Goffe (Goffe, J. Riddle. "Fibroid Tumours of the Uterus as a Cause of Cancer." *Amer. Journ. Obstet.*, N.Y., April, 1905, Vol. 51, No. 4, pp. 500—505) says that "all fibroid tumours wherever situated and whatever their size and regardless of the age of the patient, except in extreme old age, should be removed forthwith." Goffe is impressed with the evidence that fibroids predispose to the development of cancer of the corpus.

Russell (Russell, A. W. "Some Cases of Uterine Myoma." *Glasgow Med. Journ.*, 1905, Vol. 63, pp. 241—252) says that cessation of growth and even the spontaneous disappearance of a fibroid

must be admitted as possible, though it is so unusual and so uncertain that it would be foolish to calculate upon its occurrence. The day is near when, owing to improved technique ensuring greater safety, the discovery of a myoma by the gynecologist will be the signal for its early removal by one of the improved methods. Russell discusses the various secondary consequences of fibroids, and says that experience has taught him that the disease is far more serious than has been thought in the past.

Bland-Sutton (Bland-Sutton, J. "The Perils and Complications of Fibroids after the Menopause." *The Lancet*, June 6, 1903, p. 1571), in a paper suggested by the one read by myself before the British Gynecological Society in 1901 which was followed by the papers of Cullingworth and Scharlieb, emphasizes the perils and complications of fibroid tumours after the menopause; necrosis and infection of fibroids after the menopause; and cancer of the uterus. He emphasizes the point that the menopause far from bringing safety and comfort to women having fibroid tumours increases the dangers of these growths. He concludes his article as follows: "Certainly there is nothing more ironical than a woman spending twenty or even thirty years of her life as a chronic invalid on account of a uterine fibroid, in the expectation that at the menopause she will be restored to health and begin a new life, and then to realize that far from this dream being fulfilled the fibroid becomes necrotic, extruded and septic, and places her life in the gravest peril! and that she may die in spite of surgical intervention."

Polak (Polak, John Osborn. "Observations on Fibromyomatous Tumours of the Uterus." *New York Med. Journ.*, May 26, 1906, p. 1061) reports his experience in operating upon 38 women having fibroids. In 12 women he performed myomectomy, and in 7 of the 12 it was necessary to perform a hysterectomy later. This experience is so unique as to deserve mention. He says that "there can be no doubt, considering the weight of evidence, that fibromyomata predispose to malignancy. Myomata are more prone than fibromyomata to malignant degeneration, and adenocarcinoma of the body in a myomatous uterus is not infrequent, particularly at or just after the menopause."

Deaver (Deaver, John B. "Hysterectomy for Fibroids of the Uterus." *Amer. Journ. Obstet.*, December, 1905, Vol. 52, No. 6, pp. 858—874) reports his experience in the removal of 250 fibroid tumours by abdominal hysterectomy, and gives a table of the complications which were found. The list of complications was so palpably incomplete that in the discussion on his paper he admitted

that the records were by no means exact. Deaver follows the classical lines in his argument, although the number of his operations and the good results secured in the last 100 as compared with his first 150 indicate that favourable cases have sufficient symptoms to cause even a surgeon advocating the traditional attitude to resort to operation.

Haultain is amongst the few who, writing recently upon the subject, question the frequency or the importance of malignant degenerations or complications of fibroid tumours (Haultain, T. W. N. "Malignant Degenerations or Complications of Fibromyomata of the Uterus." *Journ. Obstet. and Gynæc. Brit. Empire*, Vol. vi., August, 1904, p. 120). Upon limited personal material and with scanty reference to the literature, he gives his *ipse dixit* that "malignancy and fibromyomata have an almost independent origin, and but slightly affect one another." Nevertheless, he says, that out of nine cases of adenocarcinoma operated upon by himself, four were associated with fibroid tumours of the uterus. He makes one point, however, of genuine importance, which is, that as fibroid tumours frequently cause sterility, the percentage of cases of cancer of the cervix as compared with cancer of the body of the uterus would be made relatively smaller because of the lesser percentage of labours and of traumatism to the cervix.

#### OBSTRUCTION OF THE BOWELS, PARTIAL OR COMPLETE, FROM THE PRESSURE OF FIBROID TUMOURS.

Partial obstruction of the bowels from fibroid tumours is relatively common. Numerous instances of this type have come under my observation in which obstinate constipation with distension and ultimately partial paralysis or atony of the colon has been due to pressure from fibroids. In such cases digestion is usually much disturbed, with resulting malnutrition, auto-intoxication and secondary degenerative changes in the blood-vessels and kidneys. Another serious result of this condition is that after operation paralysis of the bowel, partial or complete, is not infrequent. I have seen numerous cases in which the life of a woman was in serious jeopardy from this cause, and have seen death ensue in spite of all efforts to get rid of the intestinal gas. Death in such cases is due to heart failure from pressure upon the heart through the diaphragm.

Donald, of Manchester (Donald, Archibald. *Journ of Obst. and Gyn. of the Brit. Empire*, May, 1906, Vol. ix., No. 5, p. 383), reports an interesting case of acute intestinal obstruction from a fibroid tumour. The obstruction was due to adhesions.

Pellanda (*loc. cit.*) states that in the fatal cases in the natural history of the disease, death results from compression of the bowel in about 12 per cent. of the cases.

The literature contains reports of isolated cases, and doubtless a certain percentage of cases of obstruction said to be due to adhesions are primarily due to the presence of a fibroid tumour. Perhaps the most remarkable fact in connection with fibroid tumours is how the faecal contents of the bowel pass by fibroid tumours which apparently absolutely fill the pelvis.

#### FIBROMYOMATA A CAUSE OF STERILITY.

Olshausen (Olshausen, Robert. "Myom und Schwangerschaft." *Veit's Handbuch der Gynäkologie*, Bd. ii., 1897, p. 767) states that women having fibroid tumours are often sterile. Among 1,731 married women there were 520, or 30 per cent., who were sterile. As the sterile women are those who most frequently come under the physician's observation, the true percentage of sterility is probably lower. Small subserous fibroids frequently prevent conception by distortion and displacement of the adnexa. Interstitial fibroids form a considerable hindrance to conception through the changes in the endometrium and the deformity of the uterine cavity which they produce. Cervical fibroids and cervical polyps usually prevent conception, although there are exceptions to this rule.

The statements of Olshausen commend themselves to all those who have large experience in dealing with fibroid tumours.

#### THE INFLUENCE OF FIBROID TUMOURS UPON PREGNANCY AND LABOUR.

Olshausen (*ibid.*, p. 780), from the statistics of numerous writers, concludes that the position of the child *in utero* is considerably influenced by the presence of myomata in the cervix or in the lower uterine segment. For example:—

Presentation.	Normal.	Fibroids.
Vertex .....	95%	54%
Breech .....	3·1%	24%
Transverse .....	0·6%	19%

He quotes numerous authors concerning dystocia in labour complicated with fibroids. Süsserott collected 147 cases; in 20 the forceps was used; 8 mothers and 13 children died. Nauss had 19 forceps deliveries in 241 cases; there were 5 maternal deaths. The mortality from version in fibroids is startling. Defour states that



out of 35 cases, 21 mothers and 27 children died. Out of Süsserott's 20 cases, 12 mothers and 17 children perished. Nauss reports 26 cases with 20 maternal deaths.

J. Whitridge Williams (Williams, J. Whitridge. *Obstetrics*, New York, 1903, p. 574) quotes Pinard as reporting 84 cases of fibroid tumour in 13,917 consecutive labours, or 0·6 per cent. Labour was spontaneous in 54, operative aid was required in 30, and the maternal mortality was 3·6 per cent. Williams states that submucous myomata on account of the associated hæmorrhagic changes in the endometrium predispose to abortion or miscarriage. Pregnancy also influences the tumours, causing them to increase rapidly in size, more as the result of œdema than of actual hypertrophy. The softened tumours, owing to the pressure of the growing ovum, undergo changes in shape, the pedicles may become twisted and gangrenous, and peritonitis may ensue.

At labour, the effect of the myoma depends on its size and situation. Generally speaking, subserous tumours have no great significance, except when their size leads to pressure symptoms. On the other hand a pedunculated tumour may become prolapsed into the pelvis and give rise to serious dystocia. As a rule, interstitial fibroids of the lower uterine segment or cervix offer serious obstruction to labour. Fibroids in certain cases seem to predispose to placenta prævia and post partum hæmorrhage. In the puerperium myomata not infrequently undergo degenerative changes—sometimes gangrene—if they have been subjected to prolonged pressure.

The results reported after the forceps and version might be, and probably would be, improved by substituting the Porro operation, which would not only deliver a living child, but at the same time cure the woman of the fibroid tumour.

Lack of space prevents a further study of the relation of fibroid tumours to labour, but it is well recognized that in certain cases they produce death from dystocia and from accidents to the tumour (such as twisted pedicle, necrosis and infection of the tumour), and that one of the more serious risks of labour complicated by fibroid tumours is post partum hæmorrhage, as the presence of the tumour in the uterus interferes with the normal contraction and retraction of the uterus after the expulsion of the placenta. Nevertheless there is a general consensus of opinion among those best qualified to judge that the relation of fibroid tumours to pregnancy is most marked in the production of sterility, and that unless unfavourably situated (that is, submucous and particularly in the lower segment of the uterus or in the cervix) women with fibroid tumours of moderate

size will probably go through pregnancy and labour without serious trouble. I am not acquainted with statistics dealing with a sufficiently large series of cases to state the actual risks entailed.

COMPLICATIONS OF FIBROMYOMATA OUTSIDE THE TUMOUR AND UTERUS.

In addition to the deaths which would ensue from degenerations in the tumour and complications in the uterus as a result of fibroid tumours, amongst 252 women there existed the following complications outside the tumour and uterus which would have proved fatal without operation :—

Dermoid cyst, suppurating .....	3
Dermoid cyst with twisted pedicle .....	1
Dermoid cyst, suppurating; sinus through abdominal wall from previous drainage operation .....	1
Ovarian cyst, suppurating .....	4
Ovarian cyst, twisted pedicle .....	2
Ovarian cyst, bilateral .....	16
Ovarian cyst, unilateral .....	115
Carcinoma of ovary .....	4
Papillary carcinoma of both ovaries.....	1
Abscess of ovary, bilateral .....	2
Abscess of ovary, unilateral .....	9
Tubo-ovarian abscess .....	2
Abscess of broad ligament .....	1
Pyosalpinx, bilateral .....	33
Pyosalpinx, unilateral .....	36
Pyosalpinx with tubo-ovarian abscess .....	2
Pyosalpinx and salpingitis .....	7
Hydrosalpinx with tubo-ovarian abscess .....	1
Salpingitis with tubo-ovarian abscess .....	3
Intestinal obstruction, chronic .....	7
Intestinal obstruction, acute .....	2
<b>Total .....</b>	<b>252 = 11%</b>

Some other conditions would no doubt prove fatal in a certain percentage of cases, such as: Ectopic pregnancy, parovarian cyst, disease of the kidneys due to pressure, chronic anæmia from hæmorrhage, and intercurrent diseases superinduced by the poor constitutional condition of the patient. What the percentage of deaths would be from these various complications which have been excluded from the table is, of course, unknown, but it would be appreciable. In 1904, in analyzing 1,188 cases, it was stated that 18 per cent. of them would have died of complications outside the tumour and uterus, as compared with 11 per cent. in this larger series, which indicates that the experience of different surgeons varies.

*Conditions Outside the Tumour and Uterus in 337 Cases in the Writer's Practice which would be Fatal Without Operation:—*

Dermoid cyst with twisted pedicle .....	1
Dermoid cyst, suppurating; sinus through abdominal wall from previous drainage operation .....	1
Ovarian cyst, bilateral .....	3
Ovarian cyst, unilateral .....	24
Adeno-carcinoma of the ovary .....	1
Papillary carcinoma of both ovaries.....	1
Abscess of ovary, unilateral .....	3
Abscess of broad ligament .....	1
Pyosalpinx, bilateral .....	10
Pyosalpinx, unilateral .....	6
Total .....	51 = 15%

*Conditions Outside the Tumour and Uterus which would be Fatal Without Operation in the Writer's Last 100 Consecutive Cases Subjected to Abdominal Hysterectomy:—*

Adeno-carcinoma of ovary .....	1
Ovarian cyst, bilateral .....	2
Ovarian cyst, unilateral .....	6
Abscess of ovary .....	2
Pyosalpinx, bilateral .....	6
Pyosalpinx, unilateral .....	5
Abscess of broad ligament .....	1
Total .....	23 = 23%

Thus in my total experience the estimated mortality from complications outside the tumour and uterus was 15 per cent. as compared with 11 per cent. for the mixed series of 2,274 cases, and in my last 100 abdominal hysterectomies it was 23 per cent. as compared with 11 per cent. in the total series. This would indicate that the cases coming under my care not only represent the average in gravity, but are worse than the average. This is true both of the degenerations and complications in the tumour and uterus, and also of the complications outside the uterus.

In the discussions upon this subject that followed the reading of some of my former papers, there was an attempt on the part of some to cause confusion by the claim that complications outside the tumour and uterus have nothing to do with the question of whether or not fibroid tumours should be operated upon. It is undoubtedly true that this question is secondary and relative, and not primary. It is none the less a fact that of the 2,274 women upwards of 11 per cent. would have died of the complications outside the tumour and uterus

without operation, and in my own experience it is true of 15 per cent. in 337 and of 23 per cent. in the last 100 hysterectomies. Therefore, the existence of these complications has a positive bearing upon the percentage of cases in which operation is required in women with fibroid tumours. Not only complications which would be fatal, but also numerous other complications enumerated in the tables, would demand operation even if the fibroid tumours were not present. With the abdomen once open, one would be more than a confirmed upholder of the legends and traditions of the profession to remove the complicating or associated conditions and to leave in the fibroid tumour, when both can be removed at the same time.

The same facts might be stated as follows:—The complications outside the tumour and uterus, or if the term is preferred, the associated conditions present in women with fibroid tumours, the diagnosis of which was secondary to that of the fibroid tumour, and which were perhaps obscured by the presence of the tumour and discovered only during operation upon the tumour or from the pathological study of the specimens thereafter, would, if neglected or treated by the expectant plan advised by the adherents of the classical position, have resulted in the death of 11 per cent. of the 2,274 women.

#### FIBROID TUMOURS PRODUCING FEW OR NO SYMPTOMS.

As indicated by the tables, at least two-thirds of all fibroid tumours are complicated. It is my experience that it is rare to encounter fibroid tumours which are not producing symptoms. If the tumours do not produce symptoms, the women do not consult a physician. Occasionally, of course, a pelvic examination is made for some other reason, such as to find out the cause of sterility, and in this way an accidental diagnosis of a fibroid tumour is made. But my experience fully bears out the teaching of the tables, that it is the exception for a fibroid tumour to be present and not to produce symptoms. At the present time I have under my care or within my knowledge eight women who have had small fibroid tumours for years, which have not grown and which have produced but few symptoms. All these women were advised to await events. In two of them trouble ensued. In one, a fibroid nodule became submucous and caused such active bleeding that it was necessary to do a hysterectomy at the age of fifty-four, the operation incidentally curing a supposed neuritis in the left leg, which was merely a pressure symptom; in the other, a fibroid tumour became a polypus, was thrown off from the uterus without special pain, and was re-

moved as a pedunculated growth within the vagina, the indication being hæmorrhage. This patient still has a small subperitoneal fibroid about as large as an English walnut. Other patients with fibroid tumours have passed through my hands, refused advice, and disappeared from notice, but these eight cases include all those of which I have personal knowledge as to the relative innocency of these growths. Two of them have been driven to operation, and this may prove to be the result in the remaining six. I confess that I am still influenced by the traditions of the profession with reference to this particular group of tumours, and at the present time advise expectant treatment, with considerable doubt as to its justification.

#### EXPECTANT TREATMENT IN UNCOMPLICATED FIBROID TUMOURS OF THE UTERUS.

As shown by the tables in 2,274 cases of fibroid tumours, complications or degenerations existed in 1,553; that is, two-thirds were complicated cases and one-third were uncomplicated; also that in about half the cases the complications were such that an operation would be required had no fibroid tumour been present.

This represents the facts as to fibroid tumours when they come under the observation of the gynæcologist. The advocates of the traditional teachings concerning fibroid tumours will claim that this is true only of a class, and that many women with fibroid tumours do not consult a gynæcologist, and that those who do not have no complications. Doubtless there is an element of truth in this claim, but, as stated elsewhere in this paper, it is far more than offset by the failure to record degenerations and complications in the reported series. So far as it is possible to arrive at truth by the statistical method, it is my own opinion that the table furnishes an under-, rather than an over-, statement of the facts. A careful reading of the list of degenerations in the tumour, the complications in the uterus, in the uterine appendages, in the ligaments of the uterus, and elsewhere in the abdomen, will convince the inquirer after truth that a large proportion of the women with fibroid tumours would require operation even if no fibroid tumour were present.

#### THE MORTALITY OF OPERATIONS FOR FIBROID TUMOURS.

The risk of removing fibroid tumours by operation has steadily diminished with the development of gynæcology. Recently Baldy (Baldy, J. M. "The Mortality of Operations upon Fibroid Tumours of the Uterus." *Amer. Journ. Obstet.*, Sept., 1905, Vol. lii., No. 3, p. 370) has reported his entire experience in operations upon fibroid tumours, 250 operations with 21 deaths, or 8·4 per cent. mortality.

In the last 105 operations there were three deaths, or 2·85 per cent. mortality.

Deaver (Deaver, John B. "Hysterectomy for Fibroids of the Uterus." *Amer. Journ. Obstet.*, Dec., 1905, Vol. lii., No. 6, p. 858) has reported 233 cases of operations (hysterectomy) for fibroid tumours with 21 deaths, or 8·1 per cent. mortality. In the last 105 supravaginal hysterectomies there were three deaths, or 2·85 per cent. mortality.

In the Johns Hopkins Hospital Clinic (private communication) there have been 308 myomectomies with 14 deaths, 691 hysteromyomectomies with 22 deaths, or 3·6 per cent. mortality. In the last 100 cases of operation for fibroid tumour there have been three deaths, or 3 per cent. mortality.

In my own practice, in the last 100 cases of abdominal hysterectomy for fibroid tumour (from December 22, 1900, to February 26, 1906) there was one death. This death was caused by the distension of the intestines with gas and paralysis of the heart. Autopsy showed neither peritonitis nor evidence of infection. Since December 22, 1900, there have been performed 13 vaginal myomectomies, 2 vaginal hysterectomies for fibroid tumour, 11 abdominal myomectomies and (between February 26 and May 8, 1906) 6 abdominal hysteromyomectomies, without a death, making a total of 132 cases of operation for fibroid tumour of the uterus with one death, or 0·75 per cent. mortality.

In order to estimate the present mortality of operations for fibroid tumour of the uterus, we may take the recent results at the hands of each of the surgeons quoted:—

Baldy	105 operations	3 deaths
Deaver	105 supravaginal hysterectomies	3 deaths
John Hopkins Clinic	100 abdominal operations	3 deaths
Noble	132 operations	1 death

Total	442	10 deaths = 2·26% mortality.
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In estimating the comparative risks of fibroid tumours of the uterus pursuing their natural course with the risks of the removal of these growths, we have, on the one hand, a prospective mortality of from 15 to 20 per cent. from degenerations and complications in the tumour and uterus, together with the secondary effects of these tumours upon the economy; and, in addition, a prospective mortality of 11 per cent. from complications present outside the tumour and uterus, or a total mortality approximating 30 per cent., to compare with the operative mortality of 2·26 per cent. It would seem that

there could be no question as to which is the safer policy in the treatment of fibroid tumours, and that the prompt removal of these growths is the method to be chosen. On the other hand, the advocates of the traditional teaching might claim that as the tables indicate that only 30 per cent. would die without operation, the proper method of procedure is to operate upon the 30 per cent. and to pursue an expectant plan of treatment in the remaining 70 per cent. Leaving aside the question of invalidism, which in my experience is present in a large proportion of cases of fibroid tumour, and considering only the prospect of the patient from the standpoint of the degenerations and complications in the tumour and uterus, if a woman in the group which it is proposed to treat by the expectant plan was told that under this method of treatment her chances to die of cancer of the body of the uterus were 2 per cent., of cancer of the cervix uteri were approximately 1 per cent., of sarcoma were approximately 1·5 per cent., of necrosis of the tumour were approximately 5 per cent., of cystic degeneration were 2·5 per cent., not to speak of the other less frequent fatal complications; while, on the other hand, she could have her tumour removed with the risk of 2·26 per cent., and could escape the months and years of semi-invalidism or invalidism otherwise entailed, I believe that no woman of sound mind would hesitate. Moreover, this does not represent the facts, since the most ultra-representative of the classical school would operate on about half the women because of complications or associated conditions outside the uterus, in addition to the number he would operate upon on account of symptoms caused by the tumour.

It has been urged upon me from various quarters, that supposing all the facts with reference to fibroid tumours which have been given are true, it is unwise to teach that these growths should be removed unless they threaten life at the time they come under observation, on the ground that if this teaching is accepted, the occasional and inexperienced operator will attempt the removal of these tumours with the result of a high mortality. It seems to me that the proper reply to this teaching is that science deals with truth. If the facts are as they appear to be, we should accept them; and this obligation is not modified by the patent fact that an untrained, inexperienced, or bad surgeon is far more dangerous than any type of tumour. It is a misfortune for the community that all those who practise surgery are not well trained, and that many are unwilling to serve a proper apprenticeship before attempting major surgery; but while this is patent and unfortunate, it should not prevent us from acknowledging the truth.

THE INFLUENCE OF TRADITION AND THE FORCE OF HABIT AND FASHION.

It is only necessary to read the title of this section to admit the influence of tradition, habit and fashion, in the practice of each and all of us. Some gynæcologists will open the abdomen for a displacement of the uterus or of the ovary, will break up a few adhesions, or will remove an inflamed Fallopian tube, a hydro-salpinx, a parovian cyst, a Graafian follicle cyst or a corpus luteum cyst, or will remove the vermiform appendix in the interval, when the patient is in good health, and will do each and all of these things with a clear conscience and the feeling of duty well performed, but will dispute about the conditions under which a fibroid tumour should be removed. Nevertheless, a fibroid tumour is many times more dangerous to life than any of these morbid conditions.

Those gynæcologists who adhere to the traditional attitude towards fibroids claim that an operation should not be done upon a fibroid tumour because of what may happen in the future, and that operation is only permissible when life is threatened by the tumour or when the symptoms present make life miserable or insupportable; yet the same men violate their supposed principles whenever they do an early ovariectomy or remove a vermiform appendix in the interval between attacks, or remove the uterine appendages for inflammation in the interval between the attacks of peritonitis. In other words, their attitude towards operation for fibroids is the result of the influence of custom and fashion. They have accepted early operation to avoid future trouble for the other morbid conditions enumerated, but have not yet recognized that the same principle is equally applicable to fibroid tumours.

THE IMPORTANCE OF ACCURATE RECORDS OF OPERATION IN THE STUDY OF FIBROID TUMOURS.

In order to arrive at the facts concerning fibroid tumours, it is essential that the conditions found at operations shall be exactly recorded, and that the specimens removed shall be studied from the pathological standpoint and the clinical diagnosis corrected by the laboratory findings. This must be done systematically in every case. If this were done by all gynæcologists and surgeons, and if after two years the actual results of two years' work were published, enough material would be accumulated to decide practically every question concerning fibroid tumours. Therefore, I hope that a sufficient number of men will be interested in the further study of this question to follow this method. In no other way can the facts be determined.



It is my opinion that cancer of the corpus will be found to be a much more frequent complication of fibroid tumours than is believed at present. This may also be true of sarcoma, and it is certainly true of necrosis, cystic degeneration, pressure by the tumour on the urinary organs (bladder or ureters), and pressure by the tumour on the bowels.

#### THE ADVANTAGES OF EARLY OPERATION.

It seems to me that the evidence presented is an ample demonstration of the soundness of the conclusion at which I had arrived in 1894, namely, that "it is the part of wisdom to remove fibroid tumours so soon as they are discovered, unless in particular cases some sufficient reason exists to vary the general rule. In other words, that the principle of early operation which is now (1894) generally accepted with reference to ovarian tumours is equally applicable to the treatment of fibroid tumours." The existence of constitutional disease may render operation inadvisable because of the risk involved. The desire for child-bearing in a young and childless woman may properly influence the temporary postponement of an operation or decide the question in favour of a myomectomy rather than a hysterectomy. In other cases in which the tumour is small, and especially when it is subperitoneal, and in which the symptoms are slight, the question of operation is still debateable. Which is the more dangerous, operation or the risks inherent in the natural history of such tumours? I believe myself that this question must be left to the future for decision, and that the decision will depend chiefly upon whether or not cancer of the uterus occurs as frequently in this particular group of cases as in the whole series. Should this prove to be the case, the question will be decided in favour of operation.

It also seems to me that the evidence presented demonstrates the soundness of the teaching that a fibroid tumour should be removed because of the dangers inherent in the natural course of the disease, and not because of the particular symptoms complained of when the woman comes under the observation of the physician.

Early operation offers the following great advantages over the expectant method of treatment:—

- (1) It saves long years of invalidism or semi-invalidism.
- (2) It enables women to fulfil the duties which devolve upon them instead of having their activities limited in the effort to reduce their symptoms to the minimum and to prevent accidents to the tumour.

(3) It avoids the risks to life from the development of sarcoma in the tumour and from the development of cancer in the uterus, more especially in the corpus uteri.

(4) It avoids the risks to life from degenerations in the tumour, such as necrobiosis, necrosis, secondary septicæmia; cystic degeneration; such accidents as twisted pedicle; pressure on the urinary organs; pressure on the bowels, anæmia, cardio-vascular degeneration, thrombosis, phlebitis and embolism; malnutrition; and the greater liability to intercurrent diseases arising from lowered vitality due to anæmia or to malnutrition.

(5) It greatly lessens the risks of operation. It is only necessary to contrast the risk of removing a fibroid tumour or of performing a hysterectomy for fibroid tumour in a relatively young woman with good general health and with none of the secondary ill consequences which arise from the continued development of the tumour, to similar operations upon a woman reduced by hæmorrhage, or suffering from malnutrition due to disturbances of the functions of the intestine, or upon women having secondary cardio-vascular or renal degenerations, to appreciate what is gained by early operation.

Early operation would probably eliminate, or certainly reduce to the minimum, deaths from embolism, which are relatively so common after operations when performed late in the natural course of fibroid tumours. The mortality from operation for fibroid tumours performed early would be reduced to 1 per cent. or less, as compared with probably 5 per cent. when the operation is performed under conditions as they exist at the present time.

The most important questions for consideration are:—

1. Shall the gravity of fibroid tumours be estimated from the natural history of the disease, from the degenerations in the tumour and the complications arising in the uterus, with the secondary effects upon the general economy caused by these growths, together with the complications outside the tumour and uterus which exist in women having fibroid tumours; or, shall the gravity of the fibroid tumours be estimated by the symptoms in the particular case when the woman comes under observation?

2. What are the relative risks of fibroid tumours and the operation for their removal?

3. Shall small fibroid tumours which are growing but slowly or not at all, and which are producing few or no symptoms, be removed?

4. Shall all other fibroid tumours be removed unless in the particular case there is some sufficient contra-indication?