reached the chronic stage and there is no evidence of nitrogen retention, a normal or high protein diet will probably be of greater benefit. Besides any effect the extra protein may have on the plasma, the increased quantity of urea which it yields must be of great importance. Several of our cases appear to show a parallelism between the protein content of the diet and the urinary output.

Our experience with chronic nephritics has been similar to that of Sansum and his colleagues. In nephritis the urine is usually highly acid, and such patients do better on a diet which yields an alkaline ash; the blood chemistry improves, and albumin and blood diminish in the urine. Evidence that there is a greater output of urine on such a diet is not so definite, for though the output is usually higher with a basic diet, the intake may also be greater.

DECAPSULATION

In chronic parenchymatous nephritis, the tubular tissue may remain so swollen that the urinary passages are compressed and a mechanical obstruction is caused. For such cases decapsulation of the kidneys has been suggested. Sometimes remarkable improvement in the urinary output follows this procedure, as is shown by the following case. A woman of 27, who had been oedematous for many months, had an average output of 270 c.cm. before the operation and a continued average of 1,100 c.cm. afterwards.

INDICATIONS FOR THE USE OF DIURETICS

Copious libations or the administration of saline diuretics may be useful in certain fevers and intoxications or

where it is desired to flush the urinary tract. Diuretics are mostly given with the idea of reducing oedema, but this is, after all, merely a symptom, and does not necessarily require direct treatment. Cases of heart failure seldom require special attention for the dropsy. Where digitalis fails to relieve the condition and the anasarca is embarrassing the circulation and the diaphragm, diuretics are undoubtedly helpful. A dry diet with a minimum of salt should first be tried. The most dependable supplementary diuretic for such cases is salyrgan, either alone or after preliminary administration of ammonium chloride. Urea may also be employed, but the salines and the specific diuretics are so uncertain in cardiac failure that they are hardly worth giving.

In cases of nephritis the indications are less definite. There is no evidence that in itself the oedema embarrasses the kidneys, and an artificial diuresis is not necessarily helpful. It is, however, natural enough to try to relieve a symptom when nothing material can be done to remove the primary disease. Acute nephritis is best treated by lessening the work of the kidneys and by favouring the loss of fluid, etc., by other channels. Salt restriction may be useful too. For the chronic oedemas of renal origin diuretic measures are of doubtful value. Salines may be used and copious diuresis may be produced by urea without, however, causing the disappearance of the oedema. Some of the so-called diuretics may, of course, benefit these cases in other ways. Where the blood proteins are low, no permanent effect is likely to be produced until this fault is remedied. Blood transfusion, high protein diets, or thyroid may help to accomplish this. For inflammatory oedemas and effusions into serous sacs diuretics are of little or no value.

THE ARTIFICIAL MENOPAUSE

WITH SPECIAL REFERENCE TO THE END-RESULTS OBTAINED BY VARIOUS METHODS OF INDUCTION

A CLINICAL REVIEW OF 620 CASES*

BY

L. MARTINDALE, C.B.E., M.D., B.S., F.C.O.G.

SENIOR SURGEON, NEW SUSSEX HOSPITAL, BRIGHTON; SURGEON,
MARIE CURIE HOSPITAL, LONDON

In preparing this clinical review of a series of my own cases I have tried to show, by a study of the end-results, the nature and duration of the artificial menopause, and the way in which it differs from the normal menopause; also the best and safest ways to induce an artificial menopause in an individual case, and the indications and contraindications for the various methods.

TABLE I.—Results in 620 Cases of Metropathia Haemorrhagica, Fibrosis Uteri, and Fibromyomata Treated by Various Methods from 1914 to 1933 (June)

(A few cases of severe dysmenorrhoea, tuberculosis, and serious psychosis, in which a temporary castration was indicated, are included.)

Treatment	No. of Cases	Cured
Surgical operation...	312	97.3%
Intensive x-ray therapy...	263	94.2%*
Radium treatment	45	68%*
Total	620	—

* The word "cured" in this context means: (1) Relief of symptoms (pressure, menorrhagia); (2) amenorrhoea of two years or longer in patients under the age of 38, and complete in patients over 40; (3) in the case of fibroids, a reduction of the tumour to at least one-third of its original size.

* Read in the Section of Obstetrics and Gynaecology at the Annual Meeting of the British Medical Association, Dublin, 1933.

I have treated 620 cases, as shown in Table I. The material conveniently groups itself into:

1. Cases of uterine haemorrhage of benign origin, due to metropathia haemorrhagica, fibrosis uteri, or definite fibromyomata.
2. A few cases of incapacitating dysmenorrhoea, in which every form of medical treatment has been tried and a temporary castration was indicated.
3. Cases in which a temporary or permanent menopause was indicated on account of tuberculosis, or very severe migraine occurring at the monthly times only, or the more serious psychoses.

The summary has been made from records of the patients, in which the following points have been noted: age, occupation, symptoms and physical signs, the preliminary dilatation and curetting, pathology, and date and technique of treatment; this being followed by a résumé of the end-results, giving details of the amenorrhoea, vasomotor and metabolic disturbances, nervous symptoms, and sexual reactions. Any subsequent surgical or radiological treatment the patient may have undergone has been noted, together with a list of the doctors who sent me the patients, or other surgeons or physicians who may have examined or treated the case with me. I have re-examined 109 of these patients during the last three months, and received and tabulated the answers to 380 questionnaires I sent out (whenever possible through the doctor of the patient); and it is from these data that I have worked.

TYPE OF TREATMENT ADOPTED

Surgical operation has been chosen for those cases in which:

1. The pathology of the uterus or the other pelvic organs was doubtful. (A diagnostic dilatation and curetting has been performed in a certain percentage of these cases.)

2. The size of the uterus was greater than that of a four months' pregnancy, and was causing serious pressure symptoms.

3. The fibroids were subperitoneal or submucous, or possibly undergoing degeneration. (Blood counts, with special reference to differential leucocytosis, were frequently done.)

4. The patient was young, and there was a reasonable hope that a myomectomy could be performed.

Intensive x-ray therapy was the treatment of choice in those cases in which:

1. The patient was suffering from severe climacteric haemorrhage, the uterus being fibrotic or only very slightly enlarged, and there being no intermenstrual haemorrhage.

2. The fibroid was interstitial, the uterus being enlarged to not more than the size of a four months' pregnancy, the main symptom being menorrhagia.

3. There were no physical signs or symptoms suggesting malignancy of either the uterus itself or any other pelvic organ. In cases of any intermenstrual bleeding a diagnostic dilatation and curettage was performed.

4. There was no evidence that the fibroid was undergoing necrobiotic or necrotic degeneration (differential leucocyte counts were done when this was suspected).

5. There was no evidence of cystic or other disease of the ovaries or of the tubes.

6. The patient's general condition was serious—for example, she was suffering from grave cardiac or pulmonary trouble, or any condition in which it was important to eliminate surgical shock.

Radium treatment was used in only a small percentage of cases:

As, for instance, when expense of treatment was an important factor. X-ray treatment is very costly, and as there is no intensive x-ray plant in my own hospital, and we do possess an adequate dose of radium, I treated some of the patients with radium whom I should have preferred to treat with x rays had it been possible.

Survey of Cases

I.—SURGICAL OPERATION

The 312 cases treated by surgical operation are classified under four headings, according to the nature of the operation—namely, subtotal or total hysterectomy, and abdominal or vaginal myomectomy. Table II shows the proportion of cases in which hysterectomy alone was performed, or hysterectomy with single or double oophorectomy; and the number of cases complicated by

TABLE II.—Results in 312 Cases Treated by Surgical Operation

	No. of Cases	Died	Cases Complicated by—		Cases Complicated by Malignancy of Other Pelvic Organs	Fibromyomata Complicating Pregnancy
			Carcinoma	Sarcoma		
Subtotal hysterectomy only ...	143					
Subtotal hysterectomy and oophorectomy	71	227	2	2	2	Nil
Subtotal hysterectomy and double oophorectomy	13					
Total hysterectomy only ...	21					
Total hysterectomy and oophorectomy	5	29	1	6	Nil	Nil
Total hysterectomy and double oophorectomy	3					
Abdominal myomectomy only...	25	37	3	Nil	Nil	2
Abdominal myomectomy and oophorectomy	12					
Vaginal myomectomy ...	19		1	Nil	Nil	2
Total ...	312	7	8	4	2	4

carcinoma or sarcoma of the uterus or other organs, and the operative mortality. I have included cases of myomectomy, although unless double oophorectomy was done at the same time, they should not, strictly speaking, have been included under "artificial menopause"; on the other hand, it seems fairer to do so in considering the advisability of surgical operation *versus* irradiation, especially as my mortality rate was highest in cases of myomectomy. Excluding the latter, the operative mor-

tality rate was 0.9 per cent., whereas the total operative mortality was 2.2 per cent., three patients dying of pulmonary embolism on the fifth, fourteenth, and twenty-first days after operation respectively, and three of heart disease on the second, seventeenth, and twenty-first days after operation respectively. The seventh patient died of shock twenty-four hours after operation; there was a very large post-cervical impacted fibroid and an umbilical hernia.

Fibroid Uterus Complicated by Carcinoma of Fundus

I have included only cases in which there was a fibromyoma present; of these there were eight in all. The percentage is a high one, but this is due to the fact that all the worst cases come under this surgical heading—namely, cases in which one chose operation rather than irradiation, either because of the suspicious intermenstrual bleeding or because the diagnostic curetting proved the necessity of operation. Adenocarcinoma was found in all these cases. In one case there was, in addition, a large pyometra with pyrexia. She is now well and symptom-free seven years after the panhysterectomy. One patient died two years after operation and subsequent x-ray treatment. Two cases have not been traced. Five cases are well and symptom-free after seven, four, three, three and a half, and three years respectively.

Fibroid Uterus Complicated by Sarcoma

There were four of these cases. Two are dead and two cannot be traced. In one case I did a vaginal myomectomy for a large, non-malignant, submucous fibromyoma, and two years later—namely, in 1916—a panhysterectomy for sarcoma of the uterus. In another case a subtotal hysterectomy and left salpingo-oophorectomy was done in 1929; endothelioma of the uterus was diagnosed by the pathologist, and x-ray treatment was subsequently given. In 1931 sarcomatous degeneration of the cervix was diagnosed, for which radium treatment was given, followed by x rays. The patient died eighteen months later.

Fibroid Uterus Complicated by Malignant Disease in Other Organs

In one patient, in 1917, subtotal hysterectomy and left oophorectomy for a large fibromyoma was performed. One fibroid was found to be sloughing and breaking through the uterine wall; it was diagnosed by the pathologist as non-malignant. In 1920 the patient consulted me for left sciatica and swellings in the left leg and thigh. I did an exploratory laparotomy. The recti showed red degeneration of the muscle fibres. A large tumour was felt on the left, attached to the pelvic wall; it was reddish, very vascular, and extended into the pouch of Douglas. On the right were similar tumours attached to the mesentery and small intestine; there was much free fluid. There were also large tumours in the muscles of the left thigh anteriorly, a smaller one above the lower end of the femur, and one in the right arm, anterior to the upper third of the ulna. X rays showed nothing abnormal in any of the bones. After regular x-ray treatment from 1921 to 1922 the abdomen became more normal, with less distension and very little free fluid. The patient felt well and was able to work. In December, 1922, the tumours in the thigh increased enormously following a fall; more x-ray treatment was given, and in July, 1923, the patient was in excellent health, although one hard fibrotic tumour could be felt in the left ovarian region, and the two in the thigh had become smaller and harder. The tumour in the right arm and the one in the back of the thigh had completely disappeared. In 1924 she was in excellent health and able to dance, the abdominal tumour being then smaller and harder and more movable. In July, 1925, the tumours began to undergo degeneration, and I aspirated the one in the left thigh, drawing off one and a half pints of bloodstained fluid. In May, 1926, the condition became worse, and the patient died of ascites and metastases in the liver nine years after the original operation. I quote this case as showing the value of post-operative irradiation.

I operated on a second case in 1926. The uterus was enlarged. A smooth, hard fibroid grew from the posterior wall of the supravaginal fornix, and another one in the fundus. A third tumour grew from the left side of the uterus, and was firmly adherent to, and infiltrating, the pelvic colon. Both

ovaries and tubes were normal, also the cervix. A subtotal hysterectomy and left salpingo-oophorectomy was performed, together with a resection of six inches or more of the pelvic colon, an end-to-end anastomosis being done. Macroscopically the uterus was seen to be filled by a soft friable growth. Microscopically it was endotheliomatous. Intensive x rays were given in December, 1926. The patient is now in excellent health and symptom-free seven years afterwards.

Fibroid Uterus Complicated by Pregnancy

In two cases a vaginal myomectomy was done for a large submucous fibroid complicated by a three months' pregnancy with haemorrhage.

In another I did an abdominal myomectomy for a degenerating necrobiotic fibroid, together with a Caesarean section, at nine months (healthy baby).

In another case I did a myomectomy for a degenerating fibroid, together with a Caesarean section, for a five months' pregnancy. All these cases did well.

II.—INTENSIVE X -RAY THERAPY

In reviewing the 263 cases treated with x -ray therapy, the twenty-one cases treated this year have been deducted,

irradiated in 1924 for profuse menorrhagia. A well-known gynaecologist had refused to operate, although the uterus was fibroid, on account of her general condition and tendency to phlebitis. In 1927 she returned to me for metrorrhagia; I found a pyometra and pyrexia. After a few intrauterine douches I did a panhysterectomy, and found adenocarcinoma of the fundus, undergoing gangrenous degeneration, with much pus. She did very well, and is in excellent health now.

In another case sarcoma of one of the fibroids developed four years after irradiation. This was a married patient, aged 46, who complained of menorrhagia, dysmenorrhoea, and extreme anaemia. She had a fibroid uterus the size of a three and a half months' pregnancy. Although the fibroids were mainly interstitial there was a subperitoneal one on the right side the size of a golf ball. We discussed the case, but the husband (a doctor) dreaded operation for her on account of her general condition. Another gynaecologist had treated her for a similar condition four years previously, and had found the fibroid uterus then. In September, 1927, I gave her x -ray treatment. After two menstrual periods she started the usual menopausal symptoms. Early in 1930 I saw her again; the uterus had decreased to half its size, the fibroid condition being more marked on the right. There was pain

TABLE III.—Results (in 1933) of 242 Cases Treated by X -Ray Therapy, 1914–32*

Year of Treatment and Technique	No. of Patients Treated	No. of Patients Cured	Percentage Cured	Hysterectomy Performed Subsequently		Operations Performed Subsequently for Disease of Other Organs	
				Non-malignant	Malignant	Non-malignant	Malignant
1914–22 Technique A	51	43 (2 not traced; 3 gave up treatment before cure)	84.3	7	1 (15 years after carcinoma of cervix)	1 (Large ovarian cyst)	5 (Carcinoma of ovaries 7 years after; carcinoma of stomach 2 years after; carcinoma of breast 1 year after; malignant kidney 10 years after; malignancy of abdomen 5 years after)
1922–29 Technique B & C	124	119 (1 not traced; 1 had radium treatment later)	95.9	3	3 (7 years after carcinoma of fundus; 3 years after carcinoma of fundus; 5 years after sarcoma of fibroid)	4 (Ovarian cyst; cholecystectomy; cyst of breast; thyroidectomy, and appendicectomy)	2 (Carcinoma of breast 4 years after—very well now; carcinoma of breast 4 years after—very well now)
1929–32 Technique D	67	65 (2 patients were not traced)	97	Nil	Nil	—	—
Total ...	242	227	93.8	10	4	5	7

* Details of Technique:

A=80,000 voltage; 18–20 small ports of entry; 18 cm. focal distance; 3 mm. Al filter. Treatment every three weeks, four to seven treatments in all.
 B=155,000 voltage; four to five 6×8 cm. fields; 23 cm. focal distance; 0.5 mm. Zn + 4 mm. Al filter. One treatment on two consecutive days; average time, 4½ hours.
 C=155,000 voltage; two 20×22 cm. fields; 40–50 cm. focal distance; 0.5 mm. Zn + 4 mm. Al filter. One treatment on two consecutive days; average time, 4½ hours.
 D=186,000 voltage; four 8×10 cm., or two large fields; 30–50 cm. focal distance; 0.5 mm. Cu + 2 mm. Al filter. One treatment only; average time, 64 minutes.

as being too recent to be of any use in evaluating results. In ten of the remaining 242 cases hysterectomy was subsequently performed, although no malignancy was demonstrable at operation. The greater proportion of these cases occurred before 1922, when I was still irradiating very large fibromyomata; pressure symptoms having continued, however, one hesitated to postpone operation. In spite of this, out of the nineteen cases of fibroid uterus larger than a five months' pregnancy, and treated with x -ray therapy, twelve are well and symptom-free (1933).

Cases with Subsequent Development of Carcinoma or Sarcoma Necessitating Operation

In three of my irradiated cases carcinoma has developed in later years. In one case carcinoma of cervix developed fifteen years after irradiation for menorrhagia. In another case carcinoma of the fundus developed seven years after irradiation. I had given the patient x -ray treatment in 1923, six weeks after she had recovered from an acute mastoid. She had been dangerously ill, and operation for her severe menorrhagia was considered to be contraindicated. In 1926 she returned to me complaining of recurrent haemorrhage, for which I advised an immediate dilatation and curettage; but it was not until 1930 (that is, four years later) that she consulted a London surgeon, who gave her radium treatment, followed by an operation, when early malignancy of the fundus was found. In a third case (patient aged 50) I

in the right hip-joint on rotation. The x -ray report was: "No evidence of arthritic or pathological change in right hip or sacro-iliac joint. Ten months later, however, I found the uterus impacted in the pelvis, and advised hysterectomy. This I performed in 1931. The uterus was extremely difficult to deliver; the fibroid was in the anterior wall just above the cervix. It was the size of a grape-fruit, and was, together with the small uterus, firmly impacted in the pelvis. The pathological report stated: "The large soft fibroid showed large yellow areas of degeneration. Microscopically, the fibroid was seen to be sarcomatous. It contained large areas where the cells were irregular, with large hyperchromatic nuclei and numerous mitotic figures." After a stormy convalescence she left the nursing home, but four months afterwards she returned to me with a definite thickening in the right parametrium, and I started x -ray treatment, followed by radium. Unfortunately, the patient died five months afterwards.

From the above results one would conclude that carcinoma of the uterus following x -radiation is rare. Werner of Vienna, from his experience of 2,680 cases treated by radium or x rays for myomata or climacteric bleeding, reports an incidence of 0.3 per cent. Vogt of Tübingen, in 1,300 similar cases, reports an incidence of 0.4 per cent. My own figures are higher—1.1 per cent. for carcinoma of the uterus (including fundus and cervix) and 0.4 per cent. for sarcoma. Incidentally, one wonders whether carcinoma developing fifteen years, or even five years, after can be included in the results

following the original treatment. As, however, carcinoma of the uterus occurs in approximately 5 per cent. of all gynaecological cases, and in only 1.1 per cent. of my cases, one might equally argue that radiation has afforded a distinct protection against its development. The only safeguard would have been a panhysterectomy, but unfortunately this has even a greater mortality.

Some Non-malignant Conditions

With regard to operation performed subsequently for a non-malignant condition, in one case an ovarian cyst complicated the fibroid uterus; in another the diagnosis lay between a fibroid uterus and ovarian cyst, and I operated, doing a myomectomy. There were seven cases in which carcinoma developed in other organs many years after the artificial menopause.

Intensive α -ray therapy was also used for seven cases of severe and incapacitating *dysmenorrhoea* in which the ordinary medical and surgical treatment had failed to cure, and it was decided that induction of amenorrhoea was the correct treatment. In four of these cases the *dysmenorrhoea* was complicated by menorrhagia, and a temporary castration was done. In two cases the patients later became pregnant and had healthy children.

Tuberculosis

Four cases were complicated by tuberculosis. In one—tuberculosis of the tubes—the surgeon had to abandon the proposed hysterectomy for fibroids, and therefore transferred

told, had advised hysterectomy and oophorectomy, but who had not been told of her nervous condition. α -ray treatment on December 20th, 1929, resulted in great improvement, but in July of the following year the periods recurred (she had only had 30 per cent. to each ovary), and I gave her a further treatment, after which she had no more trouble. Lastly, a patient, aged 42, suffering from mental depression and *dysmenorrhoea*, who had been treated by various specialists, was sent to me for an artificial menopause, with excellent result.

III.—RADIUM THERAPY

These forty-five cases (1926 to June, 1933) have been classified under four headings, according to the age of the patient; 68 per cent. were cured of their symptoms. In one case the patient had a hysterectomy one year after treatment, when adenocarcinoma was found. In four cases α -ray treatment was subsequently given with success.

MENOPAUSAL SYMPTOMS FOLLOWING VARIOUS METHODS OF INDUCTION

Flushes.—In 112 surgical cases specially examined in 1933, in Group A (see Table IV), flushes were absent in 41.9 per cent. (in a further six cases all had flushes), whereas only 28.7 per cent. escaped them in Group B, the 188 cases in which the menopause had been induced by α rays. On the other hand, one must

TABLE IV.—Artificial Menopause
Analysis of symptoms in patients re-examined in 1933.

Group	Method of Induction	No. of Cases	Flushes				Change in Weight			Nervous Disturbances			
			None	Slight	Marked	Without Flushes	Unchanged	Decrease	Slight Increase	Unchanged	Increase	Decrease	Without Increase
A.	Hysterectomy, and hysterectomy and single oophorectomy	112	47	48	17	41.9%	64	9	39	96	16	Nil	85.7%
	Hysterectomy, and double oophorectomy	6	Nil	4	2	Nil	4	1	1	2	Nil	Nil	Nil
B.	Intensive α -ray therapy	188	54	113	21	28.7%	154	2	32	34	10	8	80%
C.	Radium	11	4	2	5	36%	6	1	4	Nil	3	Nil	Nil

NOTE: In Group A seventeen cases were between the ages 30 and 35. Of these, five started flushes at 14, 13, 10, 7 years, and 1 year after operation, four soon after operation, and eight have had no flushes up to date. In Group B only 52 cases were examined for nervous symptoms.

her to me for α -ray treatment. Nine years after irradiation this patient is very well, amenorrhoea being complete. In two other cases of tuberculosis of the lungs the patients were given a castration dose in order to prevent pregnancy and the exacerbations in pyrexia and general symptoms accompanying each menstruation. Amenorrhoea is so far complete and the patients have done well. In the fourth case there was tuberculosis of the caecum, for which resection had been done. Irradiation to the fibroid uterus resulted in complete amenorrhoea; the patient did well.

Psychosis

Of the cases in which the artificial menopause has been induced for the treatment of various forms of psychosis, on the advice of mental specialists, one patient had been unable to walk for eight months. On attempting to do so intention tremors of the whole body were marked. Aphonia had been the first symptom to appear, and this had persisted. There was profuse menorrhagia. Treatment was followed in two to three months by cure of the aphonia, and the patient began walking, becoming perfectly normal within five months. Another patient, aged 49, was suffering from a serious nervous breakdown with profuse menorrhagia. Six months later she was very well, and able to take up her ordinary social activities again. Another, aged 47, complained of insomnia, depression, loss of memory, and profuse menorrhagia. The patient reported distinct improvement within the first few months. Four years afterwards she writes: "Absolutely satisfactory, extremely well, and feeling younger." Another, aged 39, had *dysmenorrhoea*, followed by a severe nervous breakdown; very satisfactory result. One patient, aged 38, was suffering from various phobias, nervous trouble, and severe *dysmenorrhoea*. For the latter she had undergone a dilatation and curettage by a surgeon of Manchester, who, I was

remember that the seventeen cases between the ages of 30 and 35 did not develop menopausal symptoms until from one to fourteen years after, proving what had been noted by other observers—namely, that the menopausal symptoms in cases of hysterectomy in which one or both ovaries have been left do not appear until approximately the time at which the menopause would naturally occur. In normal women it was recently shown in a series of 1,000 cases* that 20.6 per cent. are free from flushes. From these figures it would appear that flushing, the most annoying and troublesome climacteric symptom, is less in the artificial menopause than in the natural one.

Change in Weight.—Increase in weight occurred in 33.8 per cent. of the operated cases, and in 17 per cent. of the α -rayed cases, whereas according to the report referred to above it occurs in 34.2 per cent. of normal women. This again is in favour of an α -ray artificial menopause, though one must remember that increase in weight may possibly occur later.

Nervous Disturbances.—These seem to be about equal in the case of operated and α -rayed patients, and to be of little importance. On the other hand, in three of my hysterectomy cases, and in three of my α -rayed cases, insanity followed, although in two of the latter there had been attacks of insanity before treatment.

It is, however, an undoubted fact that when the artificial menopause has been induced by α -ray therapy the menopausal symptoms differ according to the tech-

* An investigation of the menopause in 1,000 women by the Medical Women's Federation, *Lancet*, January, 1933.

nique used. For instance, with technique A, when the treatment was given in small doses every three weeks until four to six or seven treatments were given in all, the flushes came on more gradually and were noticed less. Out of fifty-one cases (technique A), only seventeen (33 per cent.) complained of flushes; none noticed a change in weight; two had very decided nervous symptoms (but in both cases they had already been under nerve specialists), and one lost her migraine attacks. Of the 124 cases (technique B and C) seventy-nine complained of flushes (63 per cent.), eighteen had increased in weight, five had decreased, nine suffered from fewer nervous symptoms, and seven who had always been "nervy" or neurotic remained so.

Of the sixty-seven cases (technique D, in which the necessary dosage is given in sixty-four minutes on one day, or divided into two doses on consecutive days), forty-six complained of flushes (68 per cent.), eleven of increase in weight, three of decrease; ten suffered from fewer nervous symptoms, whereas five of the cases confessed to always being "nervy" and remaining so.

Sexual Reactions.—I have found it more difficult to estimate these, and I can only give anything like reliable statistics in those cases of married patients I have actually interviewed, and upon whom I have made records. Sexual reactions depend upon so many different factors—general health, nature of work, occupation of leisure, temperament and psychology, or on factors such as fear of pregnancy (except in the hysterectomy and permanent α -ray castration cases). The health, occupation, and temperament of the husband also play a part. For instance, in two cases recently questioned the husband had been insane and was home temporarily on certificate. It has been found that in the operated cases two out of twenty-three complained of a definite decrease in sexual reaction, whereas in twenty-nine of the α -rayed cases none did.

Conclusion and Summary

One may say from a study of the cases that:

1. Each method of induction has its definite function. Surgical operation is the correct method for all cases in which malignancy or degeneration of the non-malignant fibroid is suspected, for all young patients in whom myomectomy may be possible, and for all cases in which the fibroid uterus is of a certain size and causing pressure symptoms. Irradiation is the treatment of choice in all cases of climacteric haemorrhage, with fibrosis uteri or small interstitial fibroids, in which there is no suspicion of carcinomatous or sarcomatous degeneration.

2. The menopausal symptoms are no more severe—indeed, not as severe—in the irradiated cases than in those of the normal climacteric.

3. The temporary amenorrhoea caused by irradiation is a valuable method of treatment in certain cases of psychosis and tuberculosis.

4. The risk of malignant disease occurring in an irradiated uterus is no greater than, if as great as, the risk of carcinoma occurring in it, or in any other organ of the body in an untreated case.

5. Accuracy in diagnosis is here, as in all other fields of medicine, one of the essential factors in successful treatment. To ensure success, therefore, the patient must remain under the care and supervision of the gynaecologist, who, if he does not himself undertake the radiological part of the treatment, will at any rate work in the closest co-operation with the radiologist—an easier ideal to attain now that so many gynaecological departments have their own intensive α -ray plant and an adequate supply of radium.

LATE RESULTS OF INJECTION TREATMENT OF VARICOSE VEINS

BY

DAVID PATEY, M.S., F.R.C.S.

ASSISTANT SURGEON, MIDDLESEX HOSPITAL

AND

R. C. TATHAM, F.R.C.S.

SURGICAL REGISTRAR, MIDDLESEX HOSPITAL

At the present time the standard treatment of varicose veins is by injections. The history of the introduction of the method, the few simple points in the technique, and the immediate reactions and possible complications are now so well known as to need no mention. There have been signs lately, however, that some observers are not finding the late results of injection treatment as satisfactory as the early results had led them to hope. The most striking contribution on these lines is that of Howard, Jackson, and Mahon,¹ who found that in forty-eight cases treated by injections and followed up all showed evidence of recurrence when re-examined at the end of a year. The time seemed opportune, therefore, for a re-examination from this point of view of the earlier cases treated at the Middlesex Hospital varicose vein clinic, and 100 consecutive cases treated by injections at the clinic two or more years previously were asked to attend for examination. Fifty of the 100 attended, while a certain number of the others replied and described their present condition; but it was decided to confine attention to the fifty cases actually re-examined.

SCOPE OF INQUIRY AND RESULTS

The series showed the usual variation, and included early cases in which the patient came with a single prominent vein giving only cosmetic offence, advanced cases with large tortuous veins occupying the greater part of both legs, and cases complicated by ulcers and dermatitis. For the present inquiry the complications were, as far as possible, ignored, and attention was centred on the effect of the injections on the veins. The solution that had been used for injection in most instances was quinine and urethane. The number of injections naturally varied from one only in the very early cases to forty-one in an advanced case.

After the patients had been re-examined and the condition compared with that noted and charted on their first attendance, they were classified as: (1) cured; (2) improved; (3) not improved. Into the category "cured" were placed those cases with no subjective symptoms and no objective signs of recurrence of the varicose veins. Into "improved" were placed those in which symptoms were absent, although definite objective signs of varicose veins were still present, or cases in which both symptoms and signs, though still present, were less marked than before treatment. Into "not improved" were placed the cases in which the symptoms were as bad as, or worse than, before treatment, and in which no objective improvement could be found. The numbers falling into each group were:

1. Cured: five cases, or 10 per cent.
2. Improved: thirty-one cases, or 62 per cent.
3. Not improved: fourteen cases, or 28 per cent.

On analysing the cases further it was found that the five cases of the "cured" group were all early cases in which originally both symptoms and signs had been slight. It will be seen that the majority of the cases fell into the "improved" group; all the patients in this group stated that they felt benefited by the treatment, even though in some cases the veins had again become