appendicitis with arthritis came to the conclusion that the articular affection was probably secondary to the appendicitis.

REFERENCES.

¹ Babcock, *Trans. Assoc. Amer. Phys.*, Phila., 1909, xxiv, 43. ² Brown, *Arch. Int. Med.*, Chicago, 1919, xxiii, 185. ³ Crispin, *Collected Papers of the Mayo Clinic*, 1916, viii, 88. ⁴ Eusterman, *Ibid.*, 1915, vii, 183. ⁵ S. Fenwick, *Lancet*, London, 1910, i, 706. ⁶ Friedman, *New York Med. Journ.*, 1918, cvii, 341. ⁷ Hilton, *Rest and Pain*, 74, 1863. ⁸ Hunner, *Journ. Amer. Med. Assoc.*, Chicago, 1908, i, 1328. ⁹ Hurst, *Arch. Röntgen Ray*, London, 1914-5, xix, 249. ¹⁰ Idem, *Constipation and Allied Disorders*, London, 1921. ¹¹ Idem, *Sensibility of the Alimentary Canal*, London, 43 et seq., 1911. ¹² Janeway, *Trans. Assoc. Amer. Phys.*, Phila.,

1909, xxiv, 69. ¹³ Leva, *Deut. med. Woch.*, 1892, xvii, 228. ¹⁴ J. A. Lichty, *Amer. Journ. Med. Sci.*, Phila., 1911, cxlii, 72. ¹⁵ M. J. Lichty, *Ohio Med. Journ.*, Columbus, 1915, xi, 779. ¹⁶ J. Mackenzie, *Symptoms and their Interpretation*, 1909, 67. ¹⁷ S. Martin, *Med.-Chir. Trans.*, London, 1901, lxxxiv, 197. ¹⁸ W. J. Mayo, quoted by Paterson, *vide infra*. ¹⁹ S. J. Meltzer, *Amer. Journ. Med. Sci.*, Phila., 1917, cliii, 469. ²⁰ Moynihan, *BRITISH MEDICAL JOURNAL*, 1908, ii, 1597 (Gall stones); 1910, i, 241 (Appendicitis); and 1919, ii, 765. ²¹ Pancoast, *Trans. Coll. Phys.*, Phila., 1917, xxxix, 257. ²² H. J. Paterson, *Lancet*, London, 1910, i, 708. ²³ Pfeiffer, *Journ. Amer. Med. Assoc.*, Chicago, 1918, lxxi, 1951. ²⁴ D. B. Pfeiffer, *Ann. Surg.*, 1915, lxi, 438. ²⁵ A. W. M. Robson, *BRITISH MEDICAL JOURNAL*, 1910, i, 973. ²⁶ Rosenow, *Journ. Amer. Med. Assoc.*, Chicago, 1914, lviii, 908. ²⁷ Sears, *Boston Med. and Surg. Journ.*, 1913, clxix, 866. ²⁸ Sherren, *Practitioner*, London, 1913, xc, 522. ²⁹ F. I. Spriggs, *Lancet*, London, 1919, i, 98. ³⁰ G. I. Stewart, *Lancet*, London, 1909, i, 1822. ³¹ Tripiet et Paviot, *Semaine méd.*, Paris, 1903, xxiii, 29.

The Lettsomian Lectures

ON

TUMOURS COMPLICATING PREGNANCY,
LABOUR, AND THE PUERPERIUM.

DELIVERED BEFORE THE MEDICAL SOCIETY OF LONDON,

BY

HERBERT R. SPENCER, M.D., B.S., F.R.C.P.,

OBSTETRIC PHYSICIAN, UNIVERSITY COLLEGE HOSPITAL.

(Abstract.)

LECTURE III.—CANCER OF THE UTERUS COMPLICATING PREGNANCY, LABOUR, AND THE PUERPERIUM.*

THE lecturer presented two tables, reproduced on page 323, giving brief particulars of the ten cases of cancer of the cervix complicating pregnancy, labour, and the puerperium which he had had under his care at University College Hospital. He had not met with a case in private practice. He related the details in each case, but it appears sufficient here to reproduce those with regard to the three cases, observed in advanced pregnancy, in which the patients, after high amputation of the cervix, survived for twenty-five, twenty-two, and nineteen years respectively.

Patient Alive 25 Years after Operation.

E. W. (Table F, No. 1), aged 33 (children 4, abortion 1) was delivered on March 25th, 1893, by forceps through a cancerous cervix, of a full-term living child, which died of whooping-cough when 11 months old. The labour was slow. The patient had had a discharge of blood for eight months. There was no post-partum haemorrhage.

On April 8th, 1893, high amputation was performed with the Paquelin cautery (see Figs. 1 and 2). On June 6th, 1894, she became pregnant in the body, which had been left behind. On March 6th, 1895, I delivered her by Caesarean section, terminated as a Porro's operation, with extra-peritoneal treatment of the stump. This child grew up and served as a soldier in the great war, 1914-18. In 1918, twenty-five years after the high amputation, the mother was examined by me and found to be in excellent health.

Patient Alive 22 Years after Operation.

A. C. (Table F, No. 2), aged 35 (children 8, abortion 0), was admitted to University College Hospital on January 3rd, 1896, when seven months pregnant. She had had haemorrhage on coitus for seven months, and a thin, watery offensive blood-stained discharge for six months. There was a large cancerous growth on the posterior lip and left side of the cervix. Labour was induced by de Ribes's bag; the child (3 lb. 7 oz.) lived only thirty-eight minutes.

On January 28th, 1896, I removed the cervix by the high amputation with the Paquelin cautery (see Figs. 3 and 4).

I have seen this patient many times since the operation. I examined her in 1918, twenty-two years after the operation, and found her free from recurrence and in excellent health.

Patient Alive 19 Years after Operation.

M. S. (Table F, No. 3), aged 38 (children 9, abortion 0), was delivered in the maternity of University College Hospital on January 25th, 1896, naturally, of a living child. She had had no bleeding during the pregnancy, but blood and shreds were passed every day afterwards. On June 5th—four months and eleven days after delivery—she was examined and found to have cancer of the cervix. High amputation was performed on June 30th, 1896.

* Delivered March 1st.

FIG. 1.—Case 1, Table F. Cervix just before the operation. From a drawing by the author. (Natural size.) *Obstet. Soc. Trans.*, xlv.

(See Figs. 5 and 6.) In 1915—nineteen years after the operation—I examined the patient and found her free from recurrence and in excellent health. The child lived at least to the age of 8 years. I have no further note about her, and the mother's present address is unknown.

(These three cases were published in the *Obstetrical Society's Transactions*, vol. xi, 1904.)

The rarity of the combination of cancer of the uterus with pregnancy is shown by the fact that few gynaecologists have published a list of even ten cases. Moreover, their cases have not been all personally treated by the authors, but are often the collected cases of clinics published in inaugural dissertations and theses, the inexperienced writers of which are wanting in the intimate knowledge which only personal attendance can give. In the clinic of Professor Wertheim, who has had such an extensive experience of this disease, amongst 250 cases of cancer of the cervix, only six were complicated with pregnancy, and some of these were not treated by him. The largest series attended at one clinic I have been able to find is that published by Glockner,¹ consisting of seventeen cases from the Zweifel's Gynaecological Clinic at Leipzig, followed by a series of ten cases from the same clinic by Aulhorn.² In 1904 Sarwey³ had been able to collect from the literature only 240 cases of this combination which had been subjected to operation, and gives the frequency (84,000 labours) as 1 in 1,600 labours.

AGE.

Of the ten patients two were between the ages of 20 and 30 (20 per cent.); seven between the ages of 30 and 40 (70 per cent.); and one was aged 40 (10 per cent.). Of Sarwey's collected series 17.8 per cent. were between 20 and 30, 64.4 per cent. were between 31 and 40, and 17.8 per cent. were between 41 and 50. From the ages of 3,442 cases of cancer not complicated with pregnancy, Sarwey shows that only 3 per cent. were between 20 and 30, 22.4 per cent. were between 31 and 43; 34 per cent. were between 41 and 50.

These figures indicate that in the child-bearing period of life cancer not combined with pregnancy is at its maximum in patients over 40, but when combined with pregnancy, under 40; and that below 30 the frequency of cancer is six times as great in the pregnant as in the non-pregnant.

The youngest of my patients was 26 years of age. I have never met with cancer of the cervix at an earlier age than this. Of Sarwey's collected cases the youngest was only 22; the oldest was 47.

NUMBER OF PREGNANCIES.

Cancer of the cervix is very rare in women who have not been impregnated. Olshausen and Döderlein have published cases of cancer complicating the first pregnancy. Cancer even in the second pregnancy is rare, having been found only six times in Sarwey's 180 cases. To these may be added my Case 3. My 10 cases had had in all 70 children and 11 miscarriages—that is, an average of 7 children and over 8 pregnancies. Six out of the 10 patients had had 8 children, and half of them had had 9 or more children, the greatest number of pregnancies being

15 (Case 9). The influence of multiparity is thus shown, as in all other statistics dealing with this combination.

The reason why cancer of the cervix should be almost confined to parous women and so extremely rare in virgins has been much discussed. Lacerations during labour and abortion have been supposed by many to be the causes, but observations on this point are few; Sir John Williams published a striking case in which the laceration was the only part of the os not affected. It seems probable that lacerations, by exposing the cervical mucous membrane to external irritation, may tend to favour the development of cancer, but its influence is probably small; for cancer often develops in cases in which there is no sign of previous laceration, and in situations where lacerations do not occur; and, moreover, cancer of similar structure occurs in the body of the uterus, where lacerations do not arise.

Erosions have been thought by some to be a pre-cancerous condition, and very radical methods of treatment have been suggested. As erosions are very common in virgins, in whom cancer of the cervix is extremely rare, it is quite certain that erosions rarely develop into cancer. Nevertheless, in erosions are sometimes found both metaplasia and hyperplasia and even slight downgrowth of the epithelium, so that occasionally the differential diagnosis from early carcinoma is difficult. To the naked eye a case of this kind sometimes shows papillary, club-like, or finger-like processes, or even extensive papillomatous growths which may closely resemble cancer. These growths are, I think, sometimes the result of excessive sexual irritation and of venereal infection. And I am inclined to think that when the question of the causation of cancer of the cervix is solved it will be found that the reason why this disease is almost limited to women who have had coitus is that local venereal infection is almost limited to them. I do not know of a series of scientific investigations into the relations of syphilis, soft scres, and gonorrhoea to cancer of the cervix, but I believe it will be found to be close. I have twice seen cancer of the cervix develop in patients who had previously had a chancre of the cervix.

FIG. 3.—Case 2, Table F. Cervix just before the operation. From a drawing by the author. (Natural size.) *Obstet. Soc. Trans.*, xlv.

Influence of the Cancer on the Pregnancy.

Cancer of the cervix, by obstructing the canal, by the haemorrhages and discharges to which it gives rise, and the infection and inflammation which often accompany it, tends to prevent the occurrence of pregnancy, and, when it occurs, to produce abortion or premature labour.

Of my ten cases two aborted spontaneously at the fifth and sixth month. Both were septic on admission to the hospital, and it is probable that the infection brought on the abortion. Apart from this there does not appear to be

a great tendency for abortion to occur in the early months. Of the six cases of pregnancy in the eighth and ninth calendar months in no fewer than three labour came on prematurely; this seems to show a great tendency to premature delivery. The growth may in some cases be so extensive as to prevent the delivery of the child, and "missed labour" may occur. In one case the uterus ruptured during labour. The high mortality is due to haemorrhage, sepsis, and rupture of the uterus.

FIG. 2.—Case 1, Table F. Microscopical drawing, low power, showing squamous-cell carcinoma. *Obstet. Soc. Trans.*, xlv.

Influence of the Pregnancy on the Cancer.

The influence of the pregnancy on the cancer has varied in different cases. The three cases which were inoperable survived from seven to twelve months, which does not show any marked rapidity of growth after delivery, seeing that in all the cases the growth had reached an advanced stage at the time of delivery, which was difficult (forceps, Caesarean section, forceps for rupture of uterus).

SYMPTOMS.

Of the three chief symptoms of cancer of the cervix—haemorrhage, discharge, and pain—the most important is haemorrhage. When the cancer complicates pregnancy the haemorrhage may lead the patient to think she is not pregnant or has miscarried.

Haemorrhage as a result of coitus is a symptom of the greatest importance. It occurred as the first symptom in Case 6 (Table F, No. 2) and was followed by a characteristic thin watery, offensive, blood-stained discharge, which after it had existed for six months led the patient to seek advice. In some cases, however, the growth does not bleed as a result of pressure upon it. An instance of this was Case 9 (Table F, No. 5), and Kreps has published a similar case (*Inaug. Diss.*, Berlin, 1905). In some cases haemorrhage occurs at approximately monthly periods and thus leads the patient into error with regard to the presence or duration of pregnancy.

Discharge is often the earliest symptom, but is unnoticed by the patient, owing to the frequency with which it occurs from other causes. When, however, it is watery and discoloured, or bloodstained, it should at once arouse

FIG. 4.—Case 2, Table F. Microscopical drawing of edge of growth showing squamous-cell carcinoma. *Med. Soc. Trans.*, xlii.

suspicion; an offensive discharge is due to necrosis, and often occurs only in the later stages of the growth.

Ordinarily pain does not occur in cancer of the unimpregnated uterus until the growth has extended beyond the organ; occasionally inflammation resulting from bacterial infection will cause it to appear while the growth is limited to the cervix. In cases complicated by pregnancy, pain may occur at an earlier date; it is due to contractions of the uterus or to a threatened or actual abortion, as well as to septicæmic infection, which is very prone to occur in these cases. The secondary symptoms—wasting, malaise, cachexia, pressure symptoms—do not differ from those met with apart from pregnancy.

DIAGNOSIS.

Cancer of the uterus complicating pregnancy always affects the cervix; there is, so far as I know, no case recorded of cancer of the body complicating pregnancy which will stand investigation. The cases formerly published were either cases of chorion-epithelioma or sarcoma.

In the early months it may be difficult to make out the condition of the pregnant uterus on account of the presence of the growth and the bleeding to which bimanual examination may give rise. On the other hand, the uterus is not rarely distended by pus (pyometra) in cases of cancer of the cervix, and it may then closely simulate a pregnant uterus, especially if menstruation has stopped. This will rarely occur apart from pregnancy until the age of the menopause (47), and pregnancy at this age is so exceedingly rare that only one case was recorded in Sarwey's collection.

On vaginal examination, either a growth or an ulcer will be felt, both differing markedly from the normal cervix by being comparatively hard and brittle, breaking down under the finger, and bleeding on pressure with the finger or the point of a sound. In later stages the uterus may be fixed by inflammation or growth in the cellular tissue; this is most easily made out by rectal examination.

On inspection through a speculum—a large Fergusson speculum, with the patient in the lithotomy position, is best for this purpose—an irregular growth with nodular or club-like processes, with or without ulceration, may be found. The colour of the growth is livid red, often sloughy on the surface, and may contrast with the purple colour of the vaginal cervix. The surface of the growth should be dried with absorbent cotton-wool, and the overhanging edge, the bleeding, and breaking down on pressure noted. If ulceration be present, the only conditions likely to be mistaken for it, namely, tubercle and syphilis, are rare.

In some cases only a hard, smooth enlargement of the cervix is met with; there is neither a projecting irregular breaking-down growth nor ulceration, the growth being in the wall of the uterus. In these cases the finger is easily passed into the cervical canal and recognizes the bleeding growth. A piece of this should be removed for microscopical examination in all cases. This is especially necessary, because the syphilitic and tuberculous affections cannot be distinguished by clinical methods, but are easily recognized under the microscope.

In ordinary cases the diagnosis of the growth is quite easy; the marked contrast of the brittle, bleeding growth with the soft tissues of the cervix of pregnancy leaves no doubt. There are, however, certain diseases of the cervix which closely resemble cancer and certain cases of cancer which lack the usual signs.

Conditions Resembling Early Cancer of the Cervix.

Hypertrophied papillary or nodular erosions, hypertrophied and inflamed glandular erosions, and papillomata (simple and diffuse) may closely simulate cancer.

By *hypertrophied papillary or nodular erosions* I mean a growth with club-like processes or lobules made up of thick connective tissue centres, often containing dilated glands, covered with a single layer of columnar or cubical epithelium. I have not met with this form during pregnancy, but the diagnosis would be difficult without microscopical examination. This form, however, is not friable.

By *hypertrophied and inflamed glandular erosion* I mean a granular condition similar to the ordinary glandular erosion, but much larger and more vascular; it sometimes measures as much as 1½ in. across, and can be broken into with the point of a sound, and bleeds readily on examination. It does not break down to the extent that cancer does, and the growth does not project from the surface, but in some cases it is necessary to excise a piece in order to exclude cancer. I have not met with this condition in pregnancy, but in the impregnated uterus have several times mistaken it for cancer until the microscope showed the nature of the condition.

Papillary growths are met with in several forms. The pedunculated papillomata of gonorrhoea are occasionally found on the cervix, but rarely, I think, without being present on the vulva or vagina. This scattered distribution is an aid to diagnosis. Broad flat papillomata with a finely granular surface may be met with both in gonorrhoea and soft sores, and, I believe, as a result of masturbation. They bleed and break down under the finger, are generally softer and more friable than cancerous growths, and can be often pinched off the surface of the

cervix with forceps, leaving a raw red surface fairly smooth and bleeding freely. Under the microscope a central vascular stem supported by connective tissue is seen surrounded by a mass of large epithelial cells often oedematous or vacuolated.

More solid isolated polypoid or sessile nodules in the cervical canal and at the external os occur occasionally; they consist of stroma of the cervix covered by many layers of squamous epithelial cells (metaplasia of cervical columnar epithelium). In the substance of these growths gland spaces may be cut across of which the epithelium has also undergone metaplasia, so that the spaces are filled

with squamous epithelium. If these growths be cut without the subjacent and adjacent tissue the appearance is not distinguishable from squamous-cell carcinoma, although a deeper section shows no such invasion of the deeper tissue of the organ as occurs in true carcinoma. In excising a portion of the cervix for microscopical examination a wedge-shaped piece should be removed including the edge of the suspected growth; care should be taken that the microscopic sections are cut vertically to the free surface and not parallel to one side of the wedge.

Lastly, I would like to direct attention to the unusual features of Case 5, Table F, which led to an erroneous diagnosis. The peculiar features were (1) the smooth surface of the growth pitted by several holes from which a pus-like fluid escaped in considerable quantity; (2) the fact that the growth did not bleed at all, although it was dressed almost daily for nearly two months; (3) that the growth did not break down under moderate pressure; (4) that it did not apparently increase at all during two months' observation, and in the puerperium at first diminished in size. I do not remember to have seen another case of cancer of the cervix in which these "pus" holes were present, although I have seen several in cancer of the vulva. In this case it is to be regretted that a piece was not excised; this would at once have shown that the growth was a columnar-cell carcinoma, and that the pus was the liquefied central epithelial cores.

Although the microscope is of the highest value and is

FIG. 5.—Case 3, Table F. Cervix. Drawing by the author after specimen had been five years in spirit. (Natural size.) *Obstet. Soc. Trans.*, xlv.

FIG. 6.—Case 3, Table F. Microscopical drawing showing squamous-cell carcinoma. *Med. Soc. Trans.*, xlii.

TABLE E.—*Author's Cases of Early Pregnancy (before the Eighth Calendar Month) complicated by Cancer of the Cervix at University College Hospital, from July, 1887, to October, 1919.*

No.	Age.	Children.	Abortion.	Month of Pregnancy.	Result to Mother.		Result to Child.		Mode of Delivery.	Operation Performed.
					Immediate.	Remote.	Immediate.	Remote.		
1	6	9	2	5th	Died (sepsis, Sept 26, 1891)	—	Died	—	Natural	No; too far advanced for curative operation; natural abortion, Sept. 8, 1891. Admitted with fever, 103°; septic; rigor.
2	40	9	1	6th	Died (sepsis, Feb. 1, 1895)	—	Lived	Died (in two days)	Natural	No; too far advanced for curative operation; natural abortion, Jan. 23, 18.5. Admitted febrile, 100°, pulse 116.
3	29	1	0	6th	Died (Nov. 25, 1906 undelivered)	—	Died	—	Undelivered	No; too far advanced for curative operation.
4	26	2	0	4th	Lived	Died (of recurrence, Sept. 24, 1907)	Died	—	Pregnant uterus removed	Vaginal hysterectomy with the galvanocautery, March 15, 1906.

TABLE F.—*Author's Cases of Advanced Pregnancy (in the Eighth or Ninth Calendar Month) complicated by Cancer of the Cervix at University College Hospital, from July, 1887, to October, 1919.*

No.	Age.	No. of Pregnancies.	Month of Pregnancy.	Result to Mother.		Result to Child.		Mode of Delivery.	Operation Performed.
				Immediate.	Remote.	Immediate.	Remote.		
1	33	5	Term	Lived	Well 25 years after high amputation of cervix	Lived	Died of whooping-cough 11 mths. later	Per vaginam, forceps	High amputation of cervix (April 8, 1893), a fortnight after delivery. Two years later, Porro-Caesarean section with living child, who served as a soldier in the war 1914-18.
2	35	8	8th	Lived	Well 22 years after high amputation of cervix	Lived	Died in 38 mins.	Per vaginam, induction of labour by de Ribes's bag	High amputation of cervix (Jan. 28, 1896), 18 days after delivery.
3	38	9	Term	Lived	Well 19 years after high amputation of cervix	Lived	Well 8 years later	Per vaginam, unassisted, easy	High amputation of cervix (June 30, 1896), 5 months after delivery.
4	30	9	8th	Lived	Died 7 months later	Lived	Living 6 mths. later	Per vaginam, forceps	No; too far advanced for curative operation.
5	39	15	8th	Lived	Died 12 months later	Lived	Living 6 mths. later	Per vaginam, forceps; rupture of uterus	No; too far advanced for curative operation. Rupture packed with iodoform gauze.
6	34	11	8th	Lived	Died 7 months later	Lived	Died 15 days later	Per abdomen, by Porro-Caesarean section, with use of serre-noeud	No; too far advanced for curative operation.

indispensable for the diagnosis of certain cases, clinical examination is also of great importance. For want of this I have known a distinguished pathologist decide, as the result of the examination of a microscopical section, that only normal cervical glands were present, when clinical examination showed a deeply invading cancer. In this case the rare form of cancer, "carcinoma adenomatodes," in which the glands are lined with a single layer of columnar epithelium, would have led to a serious error if reliance had been placed on the microscopic examination alone and the clinical signs had been neglected.

STATISTICS.

I have published tables of cancer of the cervix in advanced pregnancy—that is, in the eighth, ninth, or tenth month—treated by vaginal or combined abdominal and vaginal hysterectomy, from the papers of Glockner (10 cases), Olshausen and Kaussmann (8 cases), in the *Obstetrical Society's Transactions* (vol. lvi, pages 369-371). The percentage of cures in the 18 cases, operable and inoperable, is 5.5. The total immediate mortality is 33.3 per cent., operation mortality 16.6 per cent.

E. Aulhorn's 10 cases from Zweifel's clinic give the results of abdominal hysterectomy: 1 of 3 cases in "advanced" pregnancy remained well after "a good five years"; of 7 early cases 2 recurred and 5 remained free from recurrence after two to three and a quarter years.

E. Wertheim gives 6 cases: 1 advanced case, operated on by Micholitsch, remained well after five years. Of the 5 early cases 1 died of embolism, 1 recurred, the other 3 were "cured."

P. Glarner has recorded 8 cases: 3 in advanced pregnancy were treated by Caesarean section; 5 early cases were treated by abortion and vaginal and abdominal hysterectomy. All the cases recurred.

Trotta gives a list of 26 cases (1879-1905) in advanced pregnancy treated by Caesarean section and total abdominal hysterectomy. The maternal mortality was 33 per cent., the fetal 22 per cent. Of cases operated on in labour the maternal mortality was 53.3 per cent. He showed that the maternal mortality after abdominal operation was more than double and the fetal mortality only half that of the vaginal operation.

Sarwey, in 1908, gave a list of 29 cases of extended abdominal hysterectomy in all of which the mothers survived; it is made up of cases published between 1900 and 1903, but does not contain Wertheim's case of fatal embolism (1905).

Vitanza published in 1898 a paper on amputation of the cervix of the cancerous pregnant uterus. Of 7 cases seen, 4 were treated by high amputation of the cervix; the pregnancy continued and the patients bore living children. Two years later, in a paper on high amputation for cancer, he stated that of 15 early cases only 2 recurred; 9 remained free from recurrence for three to twelve years. In 6 of them pregnancy occurred from 6 months to three years after the operation. The Paquelin cautery was used in all cases after the amputation.

The preservation of the fetus and the possibility of pregnancy following high amputation, as shown by Vitanza's cases and one of mine, are valuable advantages of high amputation which should not be overlooked in considering the question of treatment.

TREATMENT.

The treatment of cancer of the cervix complicating pregnancy varies according as the case is "operable" or "inoperable" and the child is viable or not. The question of operability is usually decided by the absence of fixation of the uterus and of thickening in the parametric tissue, though operation, both vaginal and abdominal, permits the removal of the uterus in certain cases where these conditions are found. The age of viability of the child may be taken for practical purposes as in the last three lunar or two calendar months of pregnancy, in this paper called "advanced pregnancy," pregnancy of shorter duration being called "early pregnancy." In advanced pregnancy the interests of the child and the large size and vascularity of the uterus introduce special problems of treatment and increase the danger of the operation, which is especially great during the course of labour.

Modes of Treatment.

The chief modes of operative treatment which have been employed for cancer complicating pregnancy are by high amputation, vaginal hysterectomy, extended vaginal hysterectomy, abdominal hysterectomy, extended abdominal hysterectomy, and combined abdominal and vaginal hysterectomy.

In the course of the last ten years, great advance has been made in the treatment of cancer of the cervix by radium, mesothorium, and x rays, and for the last five years in several of the chief clinics of Europe operation has been almost entirely abandoned in favour of radiation treatment. It would seem to entail some risk to the fetus, and I am not aware that it has been employed during the course of pregnancy.

The patients are on the average younger, and therefore presumably stronger than non-pregnant patients, but the disease is apt to be more malignant in the young. The glands are, however, comparatively rarely affected (Wertheim).

Treatment during "Early Pregnancy."

(a) "Operable" cases should be operated on at once. The opinion once held that cancer complicating pregnancy was inevitably fatal can no longer be maintained. The best results have been obtained by the extended abdominal hysterectomy, Wertheim's results having been unequalled by any other method. In view of the fact that the glands are rarely affected, vaginal hysterectomy (preferably performed with the cautery) may be employed in feeble or fat patients, as it has a much lower mortality than the abdominal operation, and amputation of the cervix may be performed in early cases of squamous carcinoma, in which there is a desire to preserve the life of the child and the fertility of the mother. During labour or abortion the same operations may be performed if the case is not infected; if infected, the whole womb should be removed.

(b) "Inoperable" cases. If the case is not accompanied by bleeding or infection, the patient should be kept at rest and Porro's operation with the *serre-neud* be performed when the pregnancy is "advanced." During labour or abortion the case should be treated on general principles, with a view of preventing infection, and subsequently treated during the puerperium with the cautery, radium, and x rays.

Treatment during "Late Pregnancy."

(a) "Operable" cases should be treated by Caesarean section, followed by extended abdominal hysterectomy. If the patient is in fair condition, the operation is indicated equally on the ground of science and humanity.

If the patient is feeble or the growth infected, it might be preferable to remove the cervix by the cautery, and then remove the child by the vagina or by the abdomen, and apply radium after, or without, the removal of the uterus. This procedure would probably be safer to the mother than the performance of abdominal Caesarean section and the removal of the uterus (or the cervix after amputation) by the vagina, but would involve some increased risk to the child. Vaginal Caesarean section entails too great a risk of implantation of cancer cells, and no case is recorded in which it has been followed by cure.

During labour the risk to the patient is greatly increased. In the early stages of labour Caesarean section, followed by the extended abdominal hysterectomy, will usually be the best treatment. But if the labour be advanced and the growth not extensive, it may be safer to deliver the patient *per vias naturales*, and afterwards, at an early period of the puerperium, to treat the diseases by one of the methods mentioned. It is noteworthy that five of the seven advanced cases "cured" were operated on after delivery.

(b) "Inoperable" cases should be treated by Porro's operation with the use of the *serre-neud*. It has the advantage over the conservative Caesarean section that it removes the placental site from the risk of infection, and over Caesarean hysterectomy with intraperitoneal stump that, in case of infection, discharges will readily escape by the side of the wire, which can be placed on any height above the growth, provided the placental site be removed. In the case of a dead or putrid child it would be possible by the Porro method to close the peritoneal wound above

and around the uterus before the body of the organ was opened or amputated.

During the puerperium the treatment does not differ essentially from the treatment of cases of cancer in the unimpregnated.

At the present time there is a great tendency abroad to treat these cases with radium, mesothorium, and x rays, a reaction having set in against the extended abdominal hysterectomy on account of its high rate of mortality. The late Dr. Pozzi¹⁰ proposed a restricted vaginal hysterectomy completed by radium therapy in cases of cancer of the uterus. Although such an operation is unsuitable for some cases of cancer during pregnancy, I believe that in the puerperium vaginal hysterectomy, or high amputation, performed with the cautery and completed by the application of radium and x rays, will be found to give better results than the extensive operations now usually practised.

The three cases of high amputation described in this lecture which have remained free from recurrence for twenty-five, twenty-two, and nineteen years, are instances of the possibility of cure by simple operations, which are free from danger. As far as I know only two other cases of cancer complicating labour in advanced pregnancy are recorded which have remained well for five years: after operation—namely, Olshausen's (five and three-quarter years), and Von Ott's (eight and a half years) both operated on by vaginal hysterectomy in the puerperium. Two additional cases have been cured—namely, Micholitz's (five years) and Aulhorn's (five years), both operated on by the extended abdominal hysterectomy. The former was in advanced pregnancy but not in labour; no information as to the presence of labour was given in Aulhorn's case. I attribute the result in my cases to the use of the cautery (in two of the cases) and of antiseptic douches, and also to the fact that the operation was performed after delivery when the tissues were involuting.

The rarity of cure of cancer complicating labour in advanced pregnancy seems to justify the republication of these cases with a later after-history.

Sarwey, in Veit's *Handbuch der Gynäkologie*, while mentioning the title of my former paper in the bibliography, does not allude to the cases in the text. Perhaps the after-history of Case 5 may lead the next German writer on the subject to consider the cases worthy of mention.

REFERENCES.

- ¹ *Beiträge für Geb. und Gyn.*, Leipzig, 1902. ² *Archiv für Gyn.*, vol. xii, p. 242. ³ Veit's *Handbuch der Gyn.*, vol. II, p. 850 (1908). ⁴ *Archiv für Gyn.*, vol. xii, p. 242. ⁵ Die erweiterte abdominale Operation bei Carcinoma Colli Uteri, 1911, p. 196. ⁶ *Inaug. Diss.*, Zürich, 1907. ⁷ *Archiv für Ost. u. Gynecol.*, April, 1906, p. 172. ⁸ *Loc. cit.* ⁹ *Archiv für Ost. u. Gynecol.*, 1898, p. 670, and 1900, p. 257. ¹⁰ *Revue de Gynecologie*, vol. xxiii, p. 209 (1915).

THE THERAPEUTIC VALUE OF OXYGEN
IN PULMONARY LESIONS.

PRELIMINARY NOTE.

BY

JONATHAN C. MEAKINS, M.D., F.R.C.P. EDIN.,
CHRISTISON PROFESSOR OF THERAPEUTICS, UNIVERSITY
OF EDINBURGH.

It has been demonstrated by Stadie¹ that in cases of pneumonia with cyanosis there may be a considerable deficiency in the oxygen content of the arterial blood. He determined this by examining blood taken from the radial artery, using the technique of Van Slyke.² Using due precautions during collection against exposure to air, he estimated in one sample of the blood the oxygen content and in another sample the total oxygen capacity of the blood; then by comparison of the two results he determined the degree to which the arterial blood was unsaturated with oxygen.³ In normal persons he found this to average 5 per cent. His results showed that there was a close relation between the degree of unsaturation of the blood with oxygen and the degree of cyanosis; while in addition there was a direct relation between the intensity of the cyanosis and the condition of the patient. In other words, the greater the degree of oxygen unsaturation of the arterial blood the more critical was the patient's condition.

The value of oxygen administration in pneumonia has been a subject of much controversy, and the present