which time the blisters varied in size and number, although the patient felt well all the time. Then thirst developed and a rest of two weeks was given, during which time the blisters got worse. Calciferol was resumed, one tablet twice daily for three months with a month's rest between courses. Her present condition is good, with few blisters, and she feels much better. (b) *Lymphocytoma*:—This occurred in a woman aged 55. Biopsy showed dense aggregations of lymphocytes with very little fibrosis; there was a history of its having been present for one year. The Wassermann reaction was negative. This lesion improved under x-ray treatment, but when a fresh lesion appeared calciferol was tried—ostelin one tablet twice daily. With x-ray treatment the previous lesion was considered healed after six courses over two years. The fresh lesion was healed clinically with calciferol in four months. A further biopsy now showed a reversal of the histological picture, with dense fibrosis, dilated capillaries, and small discrete foci of lymphocytes. "Apparently a remnant of a pre-existing lymphocytoma" (Dr. Muende, St. John's Hospital, Leicester Square). (c) *Granuloma Annulare*:—One case, that of a woman aged 33. Calciferol had no effect on this lesion in any dosage orally or by local inunction.

3. A case of *multiple myelomatosis* improved while on calciferol.

Summary

Twelve cases of cutaneous tuberculosis are presented and the results discussed. Four methods of administration are outlined and some toxic symptoms described.

The effects of calciferol on blood chemistry were found to be as follows:—(a) a rise in the serum calcium usually occurs after prolonged administration; (b) an almost constant fall in the serum alkaline phosphatase generally occurs soon after the calciferol is given; and (c) the usually slightly raised serum cholesterol tends to increase before returning to normal.

The effect of calciferol appears to be that of increasing the body's resistance, and it does not seem to have any direct toxic effect on the tubercle bacillus.

Brief notes are given on some other diseases treated with calciferol.

We wish to thank members of the honorary medical staff, especially Dr. H. A. Dunlop, for valuable suggestions and advice and for permission to investigate the effect of calciferol on some of their patients; and Mr. Whittet, late chief pharmacist at Charing Cross Hospital, now at University College Hospital, for preparing the calciferol in various ways. We are also greatly indebted to Dr. Walker, of Glaxo Laboratories, for supplies of pure crystalline calciferol in nitrogen-sealed ampoules for these investigations and for undertaking the assay of the (oily) solution of A.T.10.

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Preventive Medicine and Public Health, by Prof. Wilson G. Smillie (New York, the Macmillan Company, 30s.), is an interesting book intended for the medical student who expects to practise medicine in the community. The greater part of most textbooks of public health are on environmental hygiene and the communicable diseases. Nearly half this is on child hygiene, adult health protection and promotion, and public-health administration, much of this last section being devoted to health education, medical social work, and allied subjects. The part on adult health protection will break new ground to many readers; it includes sections on geriatrics, the preventive aspects of peptic ulcer, appendicitis, heart disease, obesity, diabetes, arthritis, allergy, and alcoholism. Treatment as well as prevention is discussed in some of these sections. British readers will find much food for thought in all parts of the book—for instance, the table showing positive Wassermann reactions found in a variety of economic and social groups giving rates per thousand varying from 1 in university students, 8 in prospective blood donors, and 12 in premarital tests, up to 110 in street beggars, 240 in convicts, and 300–700 in prostitutes; the psychological implications are obvious. The diagrams are most instructive.

RETROPERITONEAL HAEMORRHAGE IN PREGNANCY

BY

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The following case may be of interest because of the great rarity of retroperitoneal haemorrhage complicating pregnancy (six cases have previously been reported), and because of its association with a condition of eclampsia and a concealed accidental haemorrhage.

Case History

The patient was a 2-gravida, aged 25, whose general health was good. She had had scarlet fever at the age of 16. In September, 1945, she had a normal pregnancy—labour of 36 hours' duration terminating in the spontaneous breech delivery of a male child weighing 8 lb. (3.6 kg.) which died from cerebral haemorrhage after half an hour.

Her menstrual history showed menarche at 14; periods regular, 28-day cycle; normal loss; no dysmenorrhoea; no intermenstrual discharge. Her last menstrual period began on Aug. 11, 1946, and the expected date of confinement was May 18, 1947. The patient had made regular attendances at her antenatal clinic. Her last visit was on April 3, when the uterus was found to be of the size of 34 weeks. The position was vertex R.O.A., the head not engaged; the foetal heart was heard. She was admitted as an emergency case at 3.30 p.m. on April 10.

At 3 p.m. that day she had felt weak and sick and had suddenly collapsed with sharp pain in the hypogastrium. She was reported to have had one fit at home and two fits while in the ambulance en route to the hospital. Pain was severe and constant. There was no history of a "show," and she had not had any frequency of micturition or dysuria. The rectum had been evacuated in the morning.

On examination she was pale and restless. The pulse varied between 110 and 120, and was of very poor volume. The blood pressure was 70/45. Nothing abnormal was detected in the heart, and the lungs were clear. The uterus was of 36 weeks' size; the position of the foetus was difficult to detect, but was thought to be vertex R.O.A. The foetal heart could not be heard. The uterus was tense, tender, and ligneous. There was no loss per vaginam. A catheter specimen of urine revealed albumin (Esbach's reaction, 10 parts per 1,000). The haemoglobin was 50%. A provisional diagnosis of concealed accidental haemorrhage and antepartum eclampsia was made.

In view of the condition of the uterus and the state of profound shock a conservative attitude was adopted and anti-shock therapy was immediately instituted. Morphine, 1/4 gr. (16 mg.), was given immediately and again four hours later. A blood transfusion of group O cross-matched blood was begun, and the patient was put on to a half-hourly pulse chart, four-hourly blood-pressure chart and fluid-balance chart, and a half-hourly respiration chart. Over a period of three hours 1½ pints (850 ml.) of blood was given and the drip was continued as a slow intravenous 10% glucose infusion in order to improve the urinary output. Potassium citrate, 15 gr. (1 g.), and phenobarbitone, 1/2 gr. (32 mg.), were given every four hours.

At 6.30 p.m., three hours after admission, the blood pressure had risen to 98/60, the pulse was 90 and regular, and the patient felt better in herself, although she still had some pain over the lower pole of the uterus. By 10.15 p.m. she was feeling much better; her blood pressure had risen to 118/60, and her uterus was softer and less tender. The foetal presentation and position could be made out distinctly as vertex R.O.A. with the head unengaged. The foetal heart was not heard.

At 10 a.m. the next day (April 11) the blood pressure was 118/70 and the pulse rate 80, and the patient was quite comfortable. The urinary output for the previous 16 hours was 10 oz. (284 ml.) and the Esbach reaction had come down to 5 parts per 1,000. Four hours later the patient complained of a recurrence of the severe abdominal pain. She was again shocked, her pulse having risen to 124 and her blood pressure

having dropped to 90/60. The fundus of the uterus had risen 2 in. (5 cm.), and the uterus had again become tense and tender. It was obvious that the patient was bleeding again into the retroplacental space. The intravenous glucose drip was changed over to cross-matched group O blood, and atropine, 1/100 gr. (0.65 mg.), was given intravenously. In view of the gravity of the situation a classical caesarean section was performed for the sake of speed, and a stillborn macerated male foetus was delivered at 2.30 p.m.

A large retroplacental haematoma was found at operation, and petechial haemorrhages were apparent deep to the peritoneal covering of the uterus. Following the injection of 5 mg. of ergometrine and 5 units of "pitocin" direct into the uterine musculature, and the application of a hot saline pack, the uterus retracted well enough to obviate the necessity for performing a hysterectomy. The patient's post-operative condition was reasonably good, her pulse being 120 and her blood pressure 100/60. "Omnopon," 1/3 gr. (22 mg.), was given post-operatively. At 6 p.m.—three and a half hours after operation—the patient was comfortable and her pulse rate was 100. The following day the pulse remained in the region of 100, the abdominal distension was slight, and 25 oz. (710 ml.) of urine was passed spontaneously after an injection of 1 ml. of carbachol. Esbach's reaction was 1 part per 1,000.

On the second post-operative day (April 13) the blood pressure remained in the region of 124/80, pulse 100, temperature 99° F. (37.2° C.). The patient was comfortable and her urinary output was 30 oz. (850 ml.). No albumin was present in the urine. Next day the blood pressure was 120/70 and the pulse round about 84. Fluid output was satisfactory and there was no albumin in the urine.

At 6 a.m. on the 15th the patient was reported to have had a fit, and on examination a few minutes later she was found to be in a state of extreme collapse, with a pulse rate in the region of 150 and almost imperceptible, blood pressure 60/?, and air hunger. It was obvious that a severe internal haemorrhage had occurred. Blood transfusion was immediately begun and 2 ml. of nikethamide given in an effort to combat the profound shock present. Moderate heat was applied in the form of a heat-cradle, the foot of the bed was raised, and 1/6 gr. (11 mg.) of omnopon was given. There was no response, and two hours later the patient died.

Post-mortem Examination

The relevant post-mortem findings were as follows:
Abdomen: The incision was clean and uniting well. The general peritoneal cavity contained about 4 pints (2.25 litres) of blood. *Uterus*: The fundus was 4½ in. (11.25 cm.) above the symphysis pubis. No adhesions were present. A classical caesarean scar was clean and uniting well. Bisection of the uterus following removal revealed a normal placental site. The uterine wall appeared pale but otherwise normal. *Intestines*: N.A.D. *Liver*: Enlarged; no obvious necrosis; areas of petechial haemorrhage beneath the peritoneum. *Spleen*: Three times normal size, lobulated, on section appeared normal. *Kidneys*: Slightly enlarged, pale, capsule stripped easily. *Stomach*: Mucosa normal. Linear retroperitoneal haemorrhage extending along the greater and lesser curvatures of the stomach.

Pancreas.—The whole region within the curvature of the first, second, and third parts of the duodenum was occupied by a large retroperitoneal haemorrhage which completely obliterated the normal situation of the pancreas. On section of this area the pancreatic tissue was seen to be broken up into scattered islets surrounded by a mass of blood clot. The peritoneum covering the floor of the lesser sac was ruptured over the superior surface of the body of the pancreas; it appeared that the haemorrhage had started near the junction of the body and neck of the pancreas, and had ruptured into the lesser sac of peritoneum and so through the aditus of the lesser sac into the general peritoneal cavity, resulting in the massive intra-peritoneal haemorrhage that had caused death.

Microscopical Examination.—*Kidney*: Glomeruli showed increased cellularity, thickening of the basement membrane, and cloudy swelling of the convoluted tubules. *Liver*: Patchy necrosis of the periphery of the lobules. *Spleen*: Some increase of the inflammatory cells. *Suprarenals*: N.A.D.

Discussion

Kenny and Doniach (1945) reported the first case of retroperitoneal haemorrhage associated with a condition of pre-eclampsia. The patient was at full term and had severe pain and shock following intercourse. At operation a retroperitoneal haemorrhage was found extending from the pelvic brim to the diaphragm. The patient died; the source of the bleeding was not found at necropsy.

Potocki (1918) was the first to describe a retroperitoneal haemorrhage associated with pregnancy. His patient was only 10 weeks pregnant, and was operated upon for a suspected ruptured ectopic gestation. At laparotomy an extensive retroperitoneal haemorrhage was found in the region of the transverse mesocolon, pancreas, stomach, and the left kidney. The patient died, the cause of death being considered to be due to a ruptured miliary aneurysm of the left renal artery.

Low (1944) reported a fatal case of retroperitoneal haemorrhage occurring two weeks from term. At necropsy a massive retroperitoneal haemorrhage was found extending from the left brim of the pelvis, behind the sigmoid colon, descending colon, and splenic flexure; it was most marked in the region of the left kidney and spleen. The patient died seven hours after a classical caesarean section. Wilson (cited by Low, 1944; Kenny and Doniach, 1945; O'Connor and Bradley, 1946) described a case of post-partum retroperitoneal haemorrhage in which the patient died on the operating table. At necropsy a ruptured aneurysm of the left renal artery was found.

Halban and Seitz (1928) considered that retroperitoneal haemorrhage was nearly always perirenal in origin, and that the condition may be secondary to renal phthisis or neoplasm or may arise spontaneously in haemophilia and nephritis.

Danforth (1945) reported a case of ruptured aneurysm of the splenic artery. The patient was a 3-gravida, aged 28, who collapsed with severe upper abdominal pain at the 28th week. She showed signs of severe internal haemorrhage, and a vaginal hysterotomy was performed because the condition was considered to be due to premature detachment of the placenta. The patient died, and necropsy revealed an aneurysmal sac of the splenic artery and rupture into the lesser sac of peritoneum. No mention was made of the urinary findings or of the blood pressure before the accident.

The most recently reported case of retroperitoneal haemorrhage arising during the course of pregnancy, and incidentally the only recorded case of recovery, was that of O'Connor and Bradley (1946). Their patient was a 2-gravida, aged 38, at full term. Pregnancy had been uneventful apart from a mild hyperpiesia, and she was admitted to hospital because of moderate pain in the left side of the abdomen. On pelvic examination a tender firm mass was found filling the posterior half of the pelvis, and a provisional diagnosis of a fibroid of the lower segment of the uterus that was likely to cause dystocia was made. A lower-segment caesarean section was performed, and after delivery of the infant the pelvic mass detected before operation was found to be a large firm retroperitoneal haemorrhage filling the whole of the true pelvis and extending into the mesentery of the sigmoid colon. The patient made an uninterrupted recovery, with gradual resolution of the pelvic haematoma. The haemorrhage was thought to have originated from a ruptured haemorrhoidal vein.

It is notable that in five out of the six previously reported cases the haemorrhage started in the region of the floor of the lesser sac of peritoneum, and in these five cases there was profound shock and the patients died. In the sixth case

the haemorrhage had a pelvic origin, the shock was less profound, and the patient recovered.

• My case naturally falls into the same category as the first five cases. The site of the haemorrhage is of interest because the tear in the peritoneum of the floor of the lesser sac lay directly over the course of the splenic artery, just distal to the bifurcation of the coeliac artery. The actual origin of the haemorrhage could not be determined because of the friability of the various tissues of the area, but, judging from the speed with which the patient bled to death, the vessel concerned must certainly have been of fairly large calibre, and the pressure behind the blood must have been sufficient to rupture the peritoneal floor of the lesser sac. This catastrophe's occurrence in close proximity to the coeliac plexus no doubt further aggravated the shock. The retroperitoneal haemorrhage which caused the death of the patient occurred on the fourth day after caesarean section for accidental haemorrhage, and it would be of interest to correlate, if possible, the condition of retroperitoneal haemorrhage with toxæmia of pregnancy. One of the outstanding features of the pathology of eclampsia is capillary thrombosis followed by extravasation of red blood cells, and I wonder whether or not a similar occurrence might happen in vessels of larger calibre in isolated instances. Certainly in two of the previously reported cases a condition of toxæmia of pregnancy was present.

Summary

A case of eclampsia complicated by an accidental haemorrhage is described.

Conservative management of the haemorrhage had to be abandoned in favour of classical caesarean section owing to the fact that the uterus remained obstinately tense, and a sudden increase in the retroplacental haemorrhage made immediate operative intervention imperative.

The patient made a smooth recovery until the fourth post-operative day, when she developed a massive retroperitoneal haemorrhage which seemed to originate in the region of the junction of the body and neck of the pancreas. The haemorrhage burst through the peritoneum of the lesser sac, and from 4 to 5 pints (2.27 to 2.84 litres) of blood passed through the aditus of the lesser sac into the general peritoneal cavity, causing death from internal haemorrhage.

A review of the literature to date is given, and an attempt is made to correlate a possible connexion between the toxæmias of pregnancy and retroperitoneal haemorrhage occurring during pregnancy.

My thanks are due to Dr. J. Seed, Medical Superintendent, Driffield County Hospital, East Yorks, for permission to publish the case, and to Dr. Barnard, County Pathologist to the East Riding of Yorkshire, who carried out the pathological investigations.

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• The Foreign Office announces the publication and distribution of the first volumes of the *Fiat Review of German Science*, compiled by German experts under the direction of the British, American, and French Field Intelligence Agencies (Technical). The review is written in German and covers fundamental research in pure science during the years 1939-46. The first printing is a restricted edition for official distribution between the three Allies and Unesco. The British share of about 250 sets will be issued to Governmental and other bodies within the Commonwealth, to universities and medical schools, and to the libraries of certain learned and professional societies. It is hoped that the edition will be completed within the next six months.

CLINICAL VALUE OF SOME METHODS OF ESTIMATING ERYTHROCYTE SEDIMENTATION RATE

BY

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Many papers have been published on the rate of sedimentation of red corpuscles since Westergren (1921) recorded his original observations on the significance of an increased rate of fall in tuberculous male patients. Several techniques have been devised, including the use of heparin (Rourke and Ernstene, 1930) and oxalate (Wintrobe and Landsberg, 1935) as anticoagulants. Variations in the bore and length of the measuring tube have been advised (Cutler, 1926; Wintrobe, 1936), and a micromethod is used in some sanatoria (King Edward VII Sanatorium Annual Report, 1933-4). Investigation has been made into the physical and chemical factors involved, and varying importance ascribed to the size of the tube used (Ham and Curtis, 1938), to variations in temperature during recordings (Weingarten, 1945), to the presence of anaemia (Wintrobe, 1936), and to deficiency of plasma fibrinogen (Ham and Curtis, 1938). Various factors may be allowed for in "correction charts," of which the most popular allow for degrees of anaemia evidenced by variations in the volume of packed red corpuscles (Wintrobe, 1936; Whitby and Hynes, 1938).

The sedimentation rate is now generally accepted as a useful index of activity in tuberculosis and rheumatism, but it was felt that a comparison between methods from a clinical standpoint might be interesting. This paper describes the findings of such a comparison—between the clinical course of some tuberculous patients and the trend of their sedimentation rates as estimated by the methods of Westergren (1921), Wintrobe (1936), and Whitby and Hynes (1938), the last two methods involving corrections for anaemia.

Methods of Investigation

Sedimentation rates were estimated on all patients admitted to the tuberculosis wards of the London Hospital Annexe. Four ml. of blood was aspirated from an ante-cubital vein—2 ml. being mixed with 0.5 ml. of 3.8% sodium citrate solution and the remaining 2 ml. placed in a test-tube in which a drop of a mixture of ammonium citrate (6%) and sodium oxalate (4%) had been dried. The citrated blood was drawn up into 200-mm. Westergren tubes and the oxalated blood placed in Wintrobe tubes of 100 mm. length. The length of clear plasma in the upper part of the tubes was read at the end of one hour, and in the case of the Wintrobe tubes the volume of packed corpuscles was read after 24 hours. The investigation was carried out at laboratory temperatures varying from about 12 to 25° C. Subsequent estimations were made at intervals ranging from two to six weeks.

At the end of a year it was possible to collect the records of 61 patients who had remained continuously under observation for periods ranging from six weeks to six months (average 3.3 months) and who had had sedimentation rates estimated by both methods on from four to ten separate occasions (average 5.6).

To the readings made using 100-mm. tubes were applied two corrections: (1) Wintrobe's correction for anaemia, and (2) Whitby and Hynes's correction, which includes a classification of the rates observed into normal and doubtfully, slightly, moderately, or severely raised.

Clinical Material.—No special selection of cases was attempted. They had all been referred for hospital observa-