the pores and bridged over intervening strands of the stroma. Areas have coalesced in an irregular manner and the appearance of reticulation results, as shown in some of the cells in Fig. 4.

All the forms of reticulation described by Brookfield (1928), from the unfragmented reticulum to the bar form, may be reproduced. Fig. 5 is an example of the bar form. The reticulocytes in Fig. 4 suggest that the next stage

results strengthen the belief that the stainable substance is not nuclear in character, but is probably a haemoglobin compound, and that the three basophilic conditions of the erythrocyte are qualitatively the same and vary only in degree. The second deduction is that the conditions, when obtained by the usual staining methods, would point to increased permeability or a defect in the lipid envelope of the erythrocyte rather than to youthfulness, although

FIG. 3.—The clumped form of punctate basophilia showing granules of irregular shape. ($\times 1,000$.)

FIG. 4.—Punctate basophilia, reticulation, and diffuse polychromasia (x). ($\times 1,000$.)

FIG. 5.—The bar form of reticulation. ($\times 1,000$.)

must be diffuse polychromasia. The cell marked X in Fig. 4 illustrates the condition up to a point, but there is a rim of unaffected material around the central stained area. This is probably due to the time given for the reaction being too short.

Comments.

This preliminary note is merely intended to place on record the fact that punctate basophilia, diffuse polychromasia, and reticulation may be produced in any erythrocyte. The time is not opportune to enter into the discussion which these results open up, but two deductions may, I think, be made. The first, that with our previous knowledge of the staining reactions the above

there may be, and probably is, a close relationship between punctate basophilia, diffuse polychromasia and reticulation, and immaturity.

I take this opportunity of expressing my thanks to my friend C. F. Hill for his invaluable assistance with the photomicrographs.

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BILATERAL OBSTRUCTION OF THE CENTRAL RETINAL ARTERIES.*

BY

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My excuse for drawing attention to this subject is that Dr. T. G. Wynne Parry published a report of a similar case in the *British Medical Journal* last February, and commented upon the rarity of the condition. As a matter of fact, a number of bilateral cases have been reported, a few of simultaneous onset, a larger number with an interval between the incidence of the condition in the two eyes. The notes of my patient are as follows:

A man, aged 50, came to Moorfields on November 20th, 1920, having lost the sight of the left eye suddenly two days before. The vision was reduced to bare perception of light, white opacity of the retina at the posterior pole of the fundus was already present, and the macula showed the typical cherry red spot. The arteries were narrow. Two weeks later the white opacity of the retina had disappeared. The right eye with spherical—2D had 6/9 vision and its retinal arteries showed slight sclerosis. Dr. Gordon Holmes reported that the blood pressure was high, 260/156, and that chronic renal disease was present.

On April 5th, 1922, he came again, having lost the sight of the right eye suddenly five nights before. Its vision was reduced to finger-counting at one metre. The right disc was atrophic, the arteries were narrow with apparent obliteration in places, and the lumina of the veins were much interrupted. There was a cherry red spot at the macula, and some whitish specks in that region.

* A paper read in the Section of Ophthalmology at the Annual Meeting of the British Medical Association, Cardiff, 1928.

Cause of the Obstruction.

The work of Coats and others has made it more than probable that most of the cases occurring in elderly folk are due to endarteritis or thrombosis in the central artery itself, and that an embolus is unusual. Embolism undoubtedly does occur, and is probably the correct explanation of the condition when it is present in young adults who are the subject of mitral stenosis, congenital heart lesions, etc. Spasm of arteries, haemorrhage into the nerve sheath, and pressure on the nerve itself are other possible, but not so well authenticated, causes. In a number of the cases occurring in young folk no cause can be detected from a general examination of the subject.

Obstruction Occurring during Sleep.

Frequently the condition of blocked central artery or vein has been noticed first on waking from sleep, and it has been concluded that, in the arterial as in the venous cases, this was suggestive of a thrombosis. In cases occurring in elderly persons with arterial disease this is likely to be the explanation, but it is possible for embolism also to occur during sleep.

MacWilliam has recently drawn attention to the not infrequent occurrence of cerebral haemorrhage, anginal attacks, and death during sleep, and he has explained this by his experimental observations on the blood pressure in this state. He finds that there are two entirely different conditions in question in sleep: (1) sound sleep, with lowering of blood pressure, (2) disturbed sleep, dreaming, etc., which may be attended with remarkable elevations of pressure.

In sound sleep, lowering of the systolic blood pressure to the extent of 15 to 30 mm. at the end of two hours

sleep is found, rising gradually in the later part of the night's rest. In 39 patients with an average systolic blood pressure of 204 Brookes and Carroll found a fall of 44 mm. after two hours' sleep. Blume found falls of 15 and 21 mm. in normal persons, but falls of 31 and 39 mm. in persons with high blood pressures.

Disturbed sleep may cause remarkable elevations of blood pressure, increased heart action, changes in respiration, and various reflex effects. MacWilliam found in one subject an elevation of systolic pressure from 125 to 180, and of diastolic from 75 to 105, an increase much greater than that which was produced by ordinary muscular exercise.

These two types of sleep are of interest to ophthalmologists in that they may both have a bearing on the incidence of arterial block in the retina. In the first, ischaemia may be brought about by the lowering of blood pressure in the presence of endarteritis with or without thrombosis; in the second, a sudden increase may dislodge a clot or a portion of valve vegetation as an embolus.

Is Treatment of any Avail in Recent Cases?

By treatment is meant the administration of amyl nitrite, massage of the globe, and paracentesis. Many cases have been reported as successful. Mr. Gordon Mackie, in a letter to this *Journal* (February 18th, 1923), stated that he had seen a definite improvement from treatment. As long ago as 1861 Alfred Graefe reported complete restoration of sight in a bilateral case after iridectomy. Mr. Paton tells me of a case in which, after massage of the eye by my father, they saw a retinal artery begin to pulsate again forty-five minutes after a complete block. Mr. Harrison Butler has also reported a case of improvement in an embolic case by treatment. Personally, I had had no success until three days ago, when a patient was admitted to hospital under my care two and a half to three hours after a central artery embolism. After amyl nitrite and vigorous massage, the vessels had resumed their normal appearance and the embolus had shifted on to a small branch. The white opacity of the retina had already developed, and it is too early yet to say what improvement of vision, if any, will be effected.

Even if no immediate improvement is noticed it is possible that early intervention may assist in some extension of the visual field, as is perhaps suggested by the following case.

The patient was a young man who had mitral stenosis and a blocked central artery; a small area escaped obstruction, being supplied by a posterior branch from the central artery or by a cilio-retinal vessel, but there was a macular "cherry" spot, surrounded later by white opacity. Three and a half hours after he had discovered the block his vision was finger-counting in the temporal part of his field. Treatment made no immediate alteration in his vision, but eighteen days later he was able to read 6/36, and three months afterwards he saw 6/24 with the affected eye.

In this case, then, some repair in the function of the retina was undoubted, and this presumably took place in the neighbourhood of the edge of the opacity, which was close to the macula itself. It now seems agreed that the usual refilling of the retinal arteries and the occasional return of vision in that part of the field around the disc are due for the most part to dilatation of capillary anastomoses between the choroidal vessels and the retinal arteries on the disc itself. Now the sooner this anastomosis is opened up the greater should be the area of the retina which is not completely atrophied by the ischaemia, and such a dilatation is likely to be favourably affected by reduction of the intraocular pressure.

Retinal haemorrhages in central artery block are sometimes seen in the neighbourhood of the disc, and are considered as due to the yielding of small capillaries, probably in the opening up of anastomoses. They might be considered as a contraindication to paracentesis. I feel, therefore, that it is right to give treatment to any recent case, but that paracentesis should be avoided if haemorrhages are present.

How soon does the White Opacity of the Retina Appear?

De Schweinitz reports that he has seen the white opacity develop as he watched a patient with the ophthalmoscope ten minutes after sudden loss of vision. Of recent cases

under my care opacity of the retina was developed in one patient when first examined two and a half hours after the onset of blindness; in another three and a half to ten hours after the onset, becoming fully developed during the following twenty-four hours; in a third (Alsford) it was well marked in nine to fifteen hours.

Visibility of Embolus in a Branch Block.

We would expect an embolus to be visible at the bifurcation from which the occluded branch comes. I have only seen three cases in which there was anything visible at this point, and in two of these the mass was apparently external to the vessel. In one it disappeared, in the other it persisted.

The first of these patients was a lad of 21 years, who was passed sound in heart and wind by Dr. Gordon Holmes. About twenty-seven hours after the incidence of a block in the inferior temporal branch I noted that "on the disc a small bit of this artery appears collapsed, narrow like a thread; at the disc margin and beyond, the calibre is normal again." That afternoon Hamblin's artist made a drawing of the fundus, which shows a white collar round the vessel at the site of the previous narrowing. This was confirmed by Mr. Doyne three days later, on December 6th, but by December 13th Doyne found that the mass had disappeared. On December 31st I, too, found no white mass on the vessel, nor was any local constriction or abnormality apparent.

My other similar case was that of a lady, aged 47, who had always been an invalid owing to a congenital heart lesion. Some six months previously she had lost the lower field of the right eye suddenly. The ophthalmoscope showed a discrete ovoid bright mass seated on the origin of the superior temporal branch, which was well within the disc margin. It covered this vessel, being considerably wider than it. Otherwise the vessels looked healthy. I saw this lady again fifteen months later, and the mass was unaltered in appearance.

I surmise that in these two cases there was some local reaction in the perivascular sheath round the embolus, possibly associated with a toxic effect of the latter, and that in the one case it was small enough to be absorbed, while in the other it has become organized into a mass of fibrous tissue or cholesterol.

Recently a woman of 38 was admitted to hospital with embolism of the central artery. The appearances of the arteries on the disc were not as if they were collapsed, but as if they were filled with a colourless material for a short distance from the centre of the disc, the normal coloration being regained just within the disc margins, and the calibre being the same throughout. After treatment the vessels appeared normal again, but further search showed a colourless segment at a bifurcation along the inferior temporal branch. Later in the day this again had moved on, and another similar segment was found still more peripherally.

In another case, under Mr. Paton, a drawing showed a white mass over the site of an embolus; this perhaps comes in a somewhat different category, as there was a good deal of haemorrhage about it, and it occurred in a patient who was the subject of a malignant endocarditis.

Hay has reported a case with "a spindle-shaped greyish-white swelling distending the lumen of the temporal branch at the fork of the inferior retinal artery." Knapp says that the embolus can be frequently observed, and appears like a bright round or angular body.

Pulsation of Vessels beyond the Block.

As is well known, it is usual for the vessels peripheral to the block to fill up after the initial collapse, and it is interesting to note in this stage how much finger pressure on the globe is necessary to produce visible pulsation in the arteries. It has been noted by several observers that pulsation beyond the block in central artery obstruction is not obtainable; collapse of the vessel may be obtained, but not pulsation. By some this has been given as a diagnostic sign of some importance in doubtful cases, but it is certainly not invariable, for I have seen pulsation easily elicited in a congenital heart case with embolism of the main central artery.

I have noted, however, in my two cases of branch block above quoted that I was unable to produce pulsation in the branch beyond the block, using an amount of pressure considerably beyond that which produced pulsation in the unaffected branches. It is to be noted that in both of these cases the block was situated on the disc itself, and the distal parts of the vessel were probably filled by dilatation of capillary anastomoses from the posterior ciliary vessels near the margin of the disc. In that case no pulse transmission would occur into the vessel, and the flow of blood therein would be very slow.

In the recent case which I have just quoted, in which the embolus moved on into a smaller branch, finger pulsation was afterwards easily elicited in the arteries on the disc.

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MYOMECTOMY DURING PREGNANCY.*

BY

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In this very short review, for which are taken as a basis cases observed in the Clinique d'Obstétrique et de Gynécologie de la Faculté de Médecine de Paris (Professor Brindeau) during the last four years, I will confine my observations to the indications and operative technique of myomectomy during pregnancy.

Primarily, let it be understood that judgement and common sense are required in the selection of each case for myomectomy during a pregnancy. As regards the indications for myomectomy in cases complicated by the presence of a fibroid or a myoma, it is only very exceptionally that operation during pregnancy is the correct procedure, because usually these tumours, while they may give rise to difficulty during the actual labour, seldom cause trouble during the pregnancy. Moreover, if it is remembered that the scar left by the operation may be the site of a rupture of the uterus during labour (and such cases are on record), it will be agreed that this procedure is to be avoided if at all possible. However, we are bound to admit that myomectomy is indicated in certain cases, these being as follows.

1. When the fibroid is large and is diagnosed early during the pregnancy, before the third month, and when the swelling of the tumour is easily distinguishable from that of the uterus. By performing myomectomy at this time all possibility of complications is avoided, during both the pregnancy and the labour.

2. At any time during the pregnancy when unmistakable signs of necrobiosis of the fibroid appear. Necrobiosis is indicated by the tumour becoming acutely painful and frequently softer in consistency. This is often preceded by hypertrophy of the fibroid, and at the same time there are signs of peritoneal reaction, such as vomiting, abdominal rigidity, and a weak pulse.

3. When, owing to the presence of a fibroid, there is an axial torsion of the uterus or a partial retroversion causing a kink in its longitudinal axis and threatening to bring about the termination of the pregnancy.

4. When there is torsion of the pedicle of the tumour, the symptoms of this occurrence being severe and lasting pain accompanied by the symptoms of peritoneal reaction mentioned above.

5. When the fibroid causes pressure on the neighbouring organs, the chief of these being the bowel (occlusion), the ureter (hydronephrosis, pyelonephritis, or anuria), the urethra (retention of urine), and the veins in the pelvis, causing oedema or thrombo-phlebitis.

With the exception of the foregoing there are no indications to justify a myomectomy during a pregnancy, although it is admitted that such an operation may be successful in other cases.

As for the operative technique, the main points for consideration are as follows.

1. General anaesthesia is preferable to spinal anaesthesia, the reason being that in the latter the contractions of the womb are not suppressed, and are even exaggerated.

2. The tumour should be decapsulated by a single incision running over its summit, and not removed by a circular incision around its base. This allows of easier decapsulation of the tumour, and also of easier closing of the peritoneum afterwards.

3. All bleeding must be carefully stopped. The best method to employ is to understitch the bleeding point with thick catgut; this must be tied loosely to avoid cutting through the tissue.

4. In cases where the fibroid is between the layers of the broad ligament an attempt should be made to approach the tumour by the transligamentous route, incising the anterior or the posterior leaf. Care must be taken to avoid the uterine vessels and the ureter while doing this.

5. No drainage should be employed.

6. Morphine should be given in large doses during the three days following operation; I give 1/6 grain every six hours.

Following these principles the following results have been obtained during a period of six years (1920-26).

Total myomectomies performed during pregnancy	52
Number of myomectomies followed by abortion...	4
Number of myomectomies followed by premature labour	4
Number of cases going to full term	41
Maternal mortality	1
Cases not seen again after leaving hospital	2
Infantile mortality, including abortions	7
Average maternal mortality	1.9%
Average infantile mortality	13%

Since January 1st, 1924, we have operated on 21 women, not only during pregnancy, but also during labour and the puerperium. In 8 of these patients we were able to perform a myomectomy: 3 before term (1 after abortion), 2 after full term, and 3 during the puerperium. In 7 cases a living child was obtained. Hysterectomy was performed in 13 cases, as follows: 1 vaginal, after abortion; 6 without Caesarean section (1 two months pregnant, 1 three months pregnant, 1 six months pregnant, and 3 during the puerperium); 6 after Caesarean section. In 9 cases living children were obtained.

These statistics show that out of 21 cases we were only obliged to operate five times during pregnancy, twice after abortion, eight times at full term, and six times during the puerperium. In other words, in 38 per cent. of the cases myomectomy was employed, and in 62 per cent. of the cases we were obliged to perform hysterectomy.

Thus it should be borne in mind that if operation is undertaken during pregnancy it is necessary in 62 per cent. of cases to perform hysterectomy; operative intervention during pregnancy should, therefore, be postponed as long as possible in order to obtain a living child.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

ABDOMINAL ANEURYSM: DEATH SEVENTEEN YEARS AND SEVEN MONTHS AFTER OPERATION.

At the Annual Meeting of the British Medical Association held in Birmingham in 1911 I reported a case of abdominal aneurysm which had been treated the previous year by the introduction of a Colt's cage of 150 inches of wire. At the time of operation there was a large saccular aneurysm in the region of the coeliac axis. The patient had been under careful medical treatment for eight months previously. A few days after operation the aneurysm commenced to harden. Eleven months later an abdominal aneurysm could still be recognized from continued pulsations and a persistent murmur below the tumour, but all pain and discomfort had disappeared and he resumed work without inconvenience. Later still the murmur disappeared, as did all trace of expansile pulsation. To the end a hard mass could be felt with transmitted pulsations from the aorta. There was a history of syphilis and for the last few years the man showed signs and symptoms of locomotor ataxia in a very chronic form.

On March 29th last the assistant medical officer of Guinness's brewery was called to see him. He complained of pain in the right lumbar region and lower abdomen. Examination revealed nothing of significance. The site of the aneurysm (in the upper left quadrant) was not

* A paper read in the Section of Obstetrics and Gynaecology at the Annual Meeting of the British Medical Association at Cardiff, 1928.