For at least three weeks after the exposures the scalp must be thoroughly treated with mild parasitocides to check the spreading of the disease. Every evening one or other of the following ointments is rubbed in all over the scalp:—Oleate of copper, gr. xx to the ounce; hydrarg.-ammonia, gr. xii, and salicylic acid, gr. x to the ounce; or Sabouraud's ointment of oil of cade 2 parts, to lanoline 5 parts. Every morning the scalp is washed with soft soap and warm water, and after drying, an iodine spirit liniment consisting of fresh tincture of iodine 1 part, and 60 per cent. alcohol 9 parts (Sabouraud). The patient is instructed to wear a small linen cap constantly, with a paper lining which is renewed every time the scalp is washed or ointment is rubbed in.

About the fourteenth day after the exposure the hair begins to fall out, and the defluvium is complete in about a week. This may take place without any perceptible inflammatory reaction, but usually a slight transient erythema supervenes about a week after the exposure and dies down with the defluvium. In only one of our cases did a marked erythema occur, which lasted for three weeks. The patient was a timid child who could not be persuaded to lie still, and in moving her head about had shifted the protecting lead sheeting on the scalp, and permitted a small triangular area to be subjected to two consecutive exposures of sixteen minutes each. Fortunately, this erythema has now subsided, and the hairs have begun to grow over the patch.

If the hairs have not fallen out by the twenty-first day a second exposure is given, but we rarely find this to be necessary since we adopted the dosage prescribed by Sabouraud. It occasionally does happen, however, that, owing perhaps to an idiosyncrasy on the part of the patient and a usually great power of resisting the action of the rays, a second exposure has to be given.

After the defluvium has taken place, the scalp is carefully examined to see that no stumps are left either in the parts of it which have not been exposed, or where the hairs have fallen out. We find that the healthy hairs are caused to fall out more readily by the rays than the diseased hairs, and a few stumps may be left as small specks over the otherwise bald areas. These short stumps usually come out later. If any stumps have been detected in the unexposed hair at the border of the patch, it is best to needle each one with croton oil by Aldersmith's method, but this procedure should not be necessary if the diseased areas be carefully mapped out before exposure, and reinfection from the falling-out stumps be prevented.

New hairs begin to appear about six weeks after the hair is shed, and the regrowth is complete in about five months. The slowness of the regrowth is an advantage rather than otherwise, for it allows time for all the diseased hairs to be eradicated before new hairs grow in.

GENERAL REMARKS.

Some experience in the treatment of ringworm by the commonly-employed methods has led one to share the belief of a number of other observers that if ringworm of the scalp is to be cured it is necessary to do more than rub in a parasiticide ointment, for however strong the parasiticide may be, it cannot penetrate sufficiently deeply into the follicle to destroy the fungus in the root of the hair. Depilation has to be resorted to, after setting up an inflammatory reaction by various irritants, such as croton oil, tar, or carbolic acid. By this means, judiciously employed, it is possible to cure a severe case in about a year or eighteen months, so that an expert would be unable to find a ringworm stump. In the *x* rays we have an ideal and painless depilating agent, and by means of them, combined with the local parasiticide treatment described above, an average case can be cured in about a third of that time.

It is a treatment, however, which is by no means easy; first there are the difficulties of the technique, second there is the all-important local treatment with the parasiticide remedies, and, third, there is the care which is requisite to avoid mishaps. Without a thorough knowledge of the disease and the ability to recognize diseased stumps this method is liable to be just as disappointing as any of the others, beside submitting the patient to a certain amount of risk.

The immediate dangers of the treatment I have already referred to, and with care they can, as a rule, be avoided, but with regard to the ultimate dangers, if there be any, sufficient time has not yet elapsed to disclose them. It has been suggested that the exposure of the scalp to the rays might have some harmful effect on the underlying brain. Certainly in an infant or a child under 3 years of age, where the scalp is thin

and the fontanelles have not closed, one would be timid about submitting the scalp to the *x* rays, but with regard to older children no misfortune of that nature has, as far as we are aware, been recorded. Another possibility has been put forward—namely, that the new hair which grows in afterwards may not be so healthy as the hair which has been shed, and might at some remote period fall out and result in alopecia. This is simply a conjecture, however, which though possible does not seem probable, and has as yet, so far as my experience goes, no evidence to support it.

GENERAL PERITONITIS DUE TO PERFORATIVE APPENDICITIS.

ILLUSTRATED BY CASES TREATED BY ABDOMINAL SECTION, WITH REMARKS ON THE QUESTION OF EARLY OPERATION.

By A. W. MAYO ROBSON, D.Sc., F.R.C.S.,
Vice-President, Royal College of Surgeons of England.

THE following cases of general peritonitis, which came under my care within ten days of each other, present points of interest in diagnosis and treatment that make the reporting of them almost a matter of duty.

They demonstrate plainly not only the importance of the early recognition and treatment of general peritonitis, but that if it be discovered and operated on within twenty-four hours of the onset, before the blood has become loaded with toxins, the outlook is far from hopeless.

Both cases also demonstrate how impossible it may be at times to diagnose appendicitis if the ordinary symptoms are relied on, for in one case the whole of the pain was at first on the left side of the abdomen and later became general, while in the other it was generalized from the onset. In neither case did the usual tender spot afford an indication, and the general distension of the abdomen and universal rigidity of the abdominal muscles simply enabled a diagnosis of general peritonitis to be made, though the history of a previous attack of pain in the caecal region in one case suggested the possibility of the peritonitis being due to perforative appendicitis. Case 1 was seen with Dr. William Blake, of West Wickham, who kindly furnished the data for the notes.

CASE I.

Mrs. H., aged 70, an otherwise healthy patient, was seen in October, 1904, for some pain in the right lower abdomen, which was followed by diarrhoea for several days. She was seen in consultation with an eminent physician, who thought the pain hepatic, though Dr. Blake suspected the appendix to be at fault.

In December, she resumed bicycling and continued to take exercise freely up to Wednesday, January 4th, 1905, when she attempted to lift her machine over a fence.

On Thursday, the 5th, she had some abdominal pain, for which Dr. Blake saw her at noon; the pain was not definitely over the caecum, but rather at the umbilicus and above and below it. At 5 p.m. a $\frac{1}{4}$ gr. morphine injection was given, but at midnight the pain returned, and during the night she vomited three times. At 8 a.m. the pain was so severe that the morphine had to be repeated. There was then noticed some rigidity of the abdominal muscles, which was rather more marked on the right side.

When I saw her with Dr. Blake at 3.30 p.m. the patient looked pinched and very ill. The vomiting was continuing; the pulse was 110, and the temperature 100° F. The abdomen was distended. It was tender all over, and the muscles were rigid, especially in the caecal region. On flicking the abdomen with the finger a fluid thrill could be felt in both flanks and across the hypogastric region. No flatus had passed by rectum and the bowels had not been moved for two days, thus raising the question of acute intestinal obstruction.

At 4.15 p.m. the abdomen was opened by a vertical incision through the right rectus sheath, when a quantity of offensive thin sero-pus escaped, the peritoneum was dusky red and both the large and small intestine were distended and of the same colour; there was no lymph barrier, and on passing the fingers to the lower end of the caecum a gangrenous and perforated appendix was at once felt and brought to the surface. The mesentery of the appendix was black and had to be ligatured beyond the gangrenous margin, which was cut away.

The root of the appendix was gripped by pressure forceps, crushed and ligatured close to the caecum, and then amputated, the stump being buried by a pursestring suture of catgut. A portion of gangrenous omentum was removed and the abdomen was thoroughly flushed with hot normal saline solution poured from a pitcher into a glass funnel held about 3 ft. above the patient, the rubber tube connected with the funnel being passed first into the pelvis and then into the right and left lumbar pouches. The lavage was discontinued when the fluid returned absolutely clear. A rubber tube with a gauze strip in it was inserted into Douglas's pouch and brought out of the wound, which was then closed layer by layer with iodized catgut. Dr. Blake wrote to say that he removed the pelvic tube on the second day and inserted a

smaller one, which he removed on the fifth day. The stitches were taken out on the fourteenth day, and she was quite well with a soundly-healed wound within a month. In March she was in perfect health.

CASE II.

The case was seen with Dr. H. Huxley, who kindly furnished me with the data for the following notes:

Master H., aged 15, a thin, active, and intelligent schoolboy, was quite well and playing golf on Thursday, January 12th. On Friday he did not feel well and could not take his breakfast. In the evening, when Dr. Huxley saw him, he complained of a little pain in the left lower abdomen, but there was no tenderness on pressure anywhere and the abdomen was quite flat. On Saturday morning the pain on the left side of the abdomen still continued, but there were no further symptoms, though he looked ill and had a "typhoid" expression. His bowels were moved during the day. The temperature in the evening was only 99° F. and the pulse corresponded. During the night he had more pain. On Sunday morning, when I was asked to see him, the abdomen was greatly distended and did not move with respiration. He vomited once or twice and could not pass flatus. The pain was altogether on the left side, though there was rather more rigidity on the right. A fluid thrill could be elicited in both flanks and across the lower abdomen.

On opening the abdomen through the right rectus sheath on the afternoon of Sunday, January 15th, within twenty hours of the onset of acute symptoms, thin sero-pus escaped and a gangrenous perforated appendix was at once discovered hanging over the brim of the pelvis. The inflammation was not limited by barrier lymph. The pelvis and both flanks were filled with septic fluid which bathed the small intestine and the viscera generally.

The abdomen was flushed with hot normal saline solution until the fluid returned clear, and, as the small intestines were immensely distended and presented here and there dark patches of impending gangrene, a loop of ileum was brought out and incised transversely, giving exit to a large quantity of gas and thin liquid faeces. This opening was held outside the abdomen, and to it the distended small intestines were "milked" between rubber-covered fingers by Mr. J. C. Forsyth, who was assisting me. When the small bowel was emptied, the opening was closed by a mucous and a serous suture and, after thorough lavage with saline solution, the protruding loop of gut was returned and the abdomen closed, a rubber drainage tube containing a gauze wick being placed so as to drain the pelvic pouch. The patient only vomited once after coming round from the anaesthetic and had the bowels moved freely the day after operation. There was no return of distension, and the tube was removed on the second day and replaced by a gauze drain, which was changed daily for several days. He was up with the wound healed by the end of the month, and is now in good health.

REMARKS.

In the first case, from the onset of symptoms up to the time of operation there was only an interval of thirty hours, so that perforation must have occurred very rapidly, and the peritonitis followed immediately. The whole of the peritoneum, parietal and visceral, was reddened, and there was not even the slightest attempt at limitation of the disease, thin pus bathing the viscera generally. The patient clearly owed her life to an early recognition of the disease and to immediate operation.

In the second case, although the patient complained of pain on Friday, the bowels were moved naturally and the symptoms were not acute. On Saturday morning the pain was altogether on the left side, and the symptoms were not such as to suggest anything serious. During Saturday night the pain increased, and when seen on Sunday morning there was general distension of the abdomen, which rapidly increased towards the afternoon, when the abdomen was opened, probably within nineteen hours of perforation. The virulence of the inflammatory process was such, that large black patches occurred here and there on the surface of the small intestines, and there was no attempt at limitation of the inflammation by lymph, thin sero-pus bathing the whole of the viscera. The small intestines were so distended that it was necessary to empty them of gas and fluid before closing the abdomen, and it is interesting to note that the distension never recurred and the bowels acted the following day.

On December 14th, 1895, I read a paper before the Medical Society of London, which was published in the *BRITISH MEDICAL JOURNAL*, December 19th, 1896, on a series of cases of appendicitis associated with general peritonitis, and I then reported six cases that I had operated on during the year 1895, five of which had recovered. I remarked that in operating where there is general infective peritonitis we must be prepared to lose some patients, even if the operation be undertaken in a fairly early stage; but that in the later stages, when distension is well marked and the pulse is becoming rapid, the percentage saved will be small, for although there ought to be no mortality in operations undertaken in the quiescent period, and only a slight one in suppurative acute cases, where the area of suppuration is limited, we can scarcely venture to

predict that we shall be able to save 82 per cent. of the cases of appendicitis accompanied by general peritonitis.

When the peritonitis is general, I believe in free irrigation with normal saline solution, and in free drainage by large rubber tubes enclosing gauze strips.

The class of case to which this paper refers is of a peculiarly tragic nature, for the patients may be in perfect health one day and at death's door within the next twenty-four or forty-eight hours.

As death is due to toxæmia from absorption through the peritoneum, it cannot be too strongly insisted on that to wait is to court disaster. If we will only take a lesson from cases of perforated gastric ulcer, where it is clearly established that every hour of delay adds to the operative mortality, we shall have a different tale to tell of perforative appendicitis with general peritonitis; for if we operate before a fatal dose of poison has been absorbed, we can remove the cause and wash away the septic material from the peritoneal cavity, when we may reasonably look forward to a good percentage of recoveries. Should there be serious distension of the intestine and threatening paresis, a dilated loop must be brought out and transversely incised; the other loops of distended bowel may then be "milked" between the rubber-covered fingers towards this opening and emptied of gas and fluid, so as to leave only empty intestine. The opening must then be closed and the neighbouring parts irrigated with hot saline solution, as in the second case reported.

If the case is only seen at a later stage when intestinal paralysis has actually occurred, besides emptying the small intestine, a small tube may be temporarily left in the caecum so as to effectually drain it until muscular tone is regained. If the stomach is distended, gastric lavage should be performed, and if needful repeated; and until the stomach will tolerate fluid, large saline enemata should be given by rectum. If necessary saline infusion may also be performed either into the cellular tissue or into the veins, according to the condition of the patient.

VOYAGES D'ÉTUDES MÉDICALES.—We have received from Dr. Carron de la Carrière details of the forthcoming seventh annual visit of medical men and students to the health resorts of France, which this year includes the watering places of the Western Pyrenees. The success of the "Voyages d'études médicales" is due to the great care taken by those in charge not only to secure the personal comfort of the visitors, but also to ensure that the arrangements at each thermal station shall afford the maximum of interesting and reliable information with the minimum of fatigue. Last autumn the health resorts in the Auvergne were inspected and the experience gained in studying the therapeutic applications of the different waters at Néris, Bourboule, Mont-Dore, Royat, Châtel-Guyon and Vichy fully confirmed Dr. Carron de la Carrière's contention that the best way of acquiring exact knowledge about any watering-place is to make investigation on the spot. The visit this year is to comprise Luchon, Capvern, Barbazan, Siradan, Bagnères-de-Bigorre, Castera-Verdun, Argeles, Barèges, Saint-Sauveur, Cauterets, Pau, Saint-Cristau, Eaux-Bonnes, Eaux-Chaudes, Salies-de-Béarn, Biarritz, Bambo, Dax and Arcachon. The travelling arrangements are comfortable and no pains are spared in providing excellent accommodation. The sum of £12 will cover all expenses from Luchon to Arcachon; it includes railways, carriages, hotels, food, luggage and tips. It will be seen, therefore, that the amount to be paid is really an inclusive charge, there being no "extras" of any kind whatsoever. The journey commences at Luchon on September 1st and ends at Arcachon on September 14th. The French railways carry passengers at half price to Luchon and the same reduction is made on the return journey from Arcachon. Those privileged to take part in the expedition are medical men and their wives and medical students. Those who propose to join in the visit should send in their names before August 15th to Dr. Carron de la Carrière, 2, Rue Lincoln, Paris, or to Dr. Leonard Williams, 8, York Street, Portman Square, London, W., who will be glad to give any further information desired. Dr. Boyd Joll, 8, Hanger Lane, Ealing, W., informs us that he is making up a party to travel to Luchon by the General Steam Navigation Company's boat to Bordeaux, which leaves London on Saturday, August 26th, and returns to London on September 19th; those who wish to proceed to Luchon via Paris can shorten the trip by about five days. Dr. Joll has already received six adherents, and estimates that the expenses of the three weeks' trip need not exceed 20 guineas.