CASE II.

A man, aged 53. Splenomedullary. Total white count 120,000 per c.mm. At first (April 18th, 1927) good response to deep therapy; spleen reduced; gain in weight; count fell to 30,000 per c.mm. By September 3rd, 1928, white count again rose to 105,000 per c.mm., and, in spite of further irradiation, was still 164,000 on February 20th, 1929. No reaction occurred in 1928 during occasional irradiation, but slight fall of white count recorded after each irradiation. At the beginning of 1929 a steady fall of phagocytes began, until, on November 12th, there were less than 1,000 phagocytes per c.mm., and a total white count of 200,000 per c.mm. (myelocytes 40 per cent., polymorphs 32 per cent., myeloblasts 0.5 per cent.). Spleen very large. The patient at this point became markedly intolerant to deep therapy, and only medical treatment was possible subsequently. He died early in 1930.

CASE III.

A man, aged 36, with typical splenomedullary leukaemia, was first seen on July 8th, 1929. Total white count 115,000 per c.mm. (myelocytes 30 per cent., polymorphs 42 per cent., nearly all phagocytic). Full doses deep therapy. White count fell to 8,500 per c.mm., spleen much reduced (September 16th). Three months later white count again rising, and, in spite of occasional irradiation, count on March 29th, 1930, was 170,000; spleen very large, marked oedema of legs. Phagocytes now only 4,000 per c.mm., compared with about 40,000 when first seen. Subsequent irradiation produced very marked constitutional reaction, vomiting, and pyrexia. A moderate fall resulted in the white count, but this immediately rose again to 120,000. Evidently response to deep therapy was beginning to fail, but by using smaller doses of deep therapy—one-quarter usual size—it has been possible up to the time of writing to avoid serious reaction and to prevent the white count from rising far above 100,000, but it is impossible to bring the count down as before.

CASE IV.

M. H., aged 44. Typical splenomedullary case. Total white count 400,000 per c.mm. (myelocytes 42 per cent., polymorphs 30 per cent.) on June 14th, 1930. Marked oedema and ascites, much loss of weight, complete prostration. Before admission splenic irradiation from Coolidge tube had produced reaction and some burns, so discontinued. When admitted, total phagocytes 90,000 per c.mm. Therefore, in spite of previous reactions, it was decided to give deep therapy in full doses. No reaction followed. On July 12th patient walking, no oedema or ascites, spleen much reduced; white count total 100,000 per c.mm., of which 60,000 were phagocytic. Patient is still quite tolerant of deep therapy, and white count is remaining below 100,000. This is an example of relatively high phagocytic power as indicating the possibility of full irradiation, in spite of extremely poor initial general condition.

Commentary.

From these cases, taken as typical of the many now treated, we think it may reasonably be suggested that determination of the number of active phagocytes present at any given time provides definite indications as to the dosage and the prognosis in general.

In the past it was customary during irradiation simply to guard against the development of a leucopenia. The phagocytic test appears to be capable of providing a definitely earlier warning. The total number of active phagocytes in a normal blood tested by our technique is about 4,000 per c.mm., and, since adopting the rule that cases, leukaemic and others, should be irradiated very lightly, or not at all if their blood contained less than 2,000 phagocytes per c.mm., no severe reactions of any kind have been encountered. It is noteworthy that at the time this investigation was started five other patients were available for blood examination who were markedly intolerant to deep therapy. Three responded by marked constitutional reaction; one had developed broncho-pneumonia, and one streptococcal skin lesions. In each case the number of normally active phagocytes in the blood was found to be 1,000 per c.mm. or less.

In selecting cases for treatment, observation of a good phagocytic power may allow one to discount other factors, such as poor general condition or septic complications, which might otherwise cause hesitation in applying vigorous irradiation.

Extension of Method.

In conclusion, it may be added that, in practice, application of this method of dosage control has not been limited to the leukaemias. Since October, 1929, all cases of diffuse glandular enlargement, neoplasm, etc., for which deep therapy treatment was considered likely to be of benefit but where the general condition was not good, have been tested in this way. By setting the standards described

above it has been found possible to reduce constitutional reaction to a minimum, and to irradiate successfully several cases which from general considerations might have been thought unlikely to tolerate the rays.

Summary.

1. The importance of an adequate supply of active phagocytes in the blood of a patient undergoing deep x-ray treatment is emphasized.

2. In leukaemias the higher the percentage of active phagocytes the better the prognosis, and the more ready their response to irradiation.

3. It is suggested that the number of active phagocytes in the blood of a patient undergoing deep x-ray treatment should not be allowed to fall below 2,000 per c.mm.

Our thanks are due to the honorary visiting staff of Guy's Hospital for their kindness and help in permitting and facilitating the repeated examination of the various patients under observation, and especially to Dr. A. F. Hurst, Dr. E. P. Poulton, Dr. N. Mutch, Dr. J. A. Ryle, and Dr. A. H. Douthwaite, under whose care the patients referred to were admitted.

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TREATMENT OF OCULAR DISEASES
WITH MERCUROCHROME.

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FEW medical men seem to realize what a useful drug we have in mercurochrome for certain ocular diseases. It is no new drug, having been used in Bristol for the last four years, so that a vast number of cases have been treated with it. My attention was first drawn to it by the fact that my surgical colleagues had proved it to be a useful antiseptic in bladder cases, and had found it practically non-irritating. In our hands, in the treatment of certain eye diseases, it has proved to be a very powerful antiseptic, and the irritation caused by it in the majority of cases is negligible. Its one disadvantage is its red colour, as this will stain the skin for a few days, but this can be obviated if, immediately after its application to the eye, any remaining on the skin is wiped off with moist cotton-wool. It is used in the form of drops made of a 1 per cent. solution, as an ointment of the same strength, or as a paint of a 1 or 2 per cent. strength.

Uses in Conjunctivitis.

The drug is of service in all types, and by far the best method of treatment is to paint both lids at once with a 1 or 2 per cent. solution, depending on the severity of the attack. In a case seen early, this treatment is invaluable for cutting short the duration of the attack, and there is no doubt that the instillation of drops, apart from the painting of the lids, loses much valuable time. For some time it has been my practice to paint these cases directly they come to me, and the results have been superior to those of any other type of treatment. The best way to apply the solution as a paint is to use a fine probe, such as that employed for the nasal duct, and, after winding a very thin piece of cotton-wool round one end, dip it into a receptacle holding perhaps ten drops of the solution; this prevents undue saturation of the cotton-wool, and if the painting is done carefully none need get on to the patient's lids. Apart from the acute cases of conjunctivitis, painting with a 2 per cent. mercurochrome is invaluable in those chronic cases in which there is a good deal of velvety thickening of the conjunctiva. This is the type of case that is so often beneficially treated with silver nitrate, or one of the silver compounds, but we have found mercurochrome superior to silver in that its irritation is considerably less (therefore it can be applied at more frequent intervals), that it cannot damage the cornea, and that there is no danger of staining the conjunctiva even if the drug be used over a very long period. It is our practice to treat this type of case with

two paintings a week, and, if this does not suffice, 1 per cent. mercurochrome drops are given to the patient to be instilled twice a day, but of late we have come to rely more and more on the painting and to discard the drops where possible, as they are certainly "messy" when used by any patient who is not careful. We believe that every type of conjunctivitis is benefited by so painting the conjunctiva; for instance, two cases of severe Parinaud's conjunctivitis, with involvement of the cervical glands, cleared up, without any surgical intervention to the glands by this treatment. A case of tuberculosis of the conjunctiva did excellently with this treatment combined with ultra-violet light. For the last four years the maternity department of the Bristol Royal Infirmary has issued a 1 per cent. solution of mercurochrome instead of the usual silver nitrate for instillation into the eyes of newborn babies. There has been a definite decrease in the cases of ophthalmia neonatorum, and now we never see those many red eyes that can be produced by silver nitrate. The only exception to our routine is if the parents are known to be infected with gonorrhoea, when silver nitrate is still used. All cases of ophthalmia neonatorum are now treated in the initial stages with mercurochrome drops; this drug, being non-irritating, can be used without fear of damage even if there be intense chemosis and swelling of the lids. In a case progressing favourably, mercurochrome painting of the lids in the later stages is also very beneficial, but in the more severe type of case one should still rely on silver nitrate in preference to mercurochrome.

Corneal Affections.

Ulcers of the cornea if seen early can, with benefit, be painted with mercurochrome, but too much reliance must not be placed on this drug to the exclusion of more energetic types of treatment. Large phlyctenulae, or the small miliary variety, at the margin of the cornea often improve considerably with mercurochrome paint. Following serious or trivial injuries to the cornea, a drop of mercurochrome into the conjunctival sac is as good an antiseptic as any.

Blepharitis.

This can be considerably benefited by the painting of the lids with a 2 per cent. solution. Before applying it all the scabs should, where possible, be removed. We use for this purpose a solution of warm sodium bicarbonate solution, applied gently with cotton-wool, so that the underlying tissues are not damaged. The edges of the lids are then thoroughly painted. The results, as compared with similar treatment with such solutions of brilliant green and iodine, show mercurochrome to be equally good, and, being so easy to apply and non-irritating to the conjunctiva, we now only use it for this condition. I have said that mercurochrome is non-irritating, but there is apparently an exceptionally rare idiosyncrasy to the drug. I have seen the occurrence only twice over a period of four years. In one, a patient suffered from oedematous lids, face, and, later, chest and body. He was seen by a dermatologist, who considered mercurochrome to be the cause. He rapidly recovered on cessation of the drug. The other patient had a considerable swelling of both eyelids of the treated eye, with a thin serous discharge, a condition very similar to atropine irritation. This cleared up rapidly on giving up the mercurochrome.

Mercurochrome in Ophthalmic Surgery.

As a preliminary to all eye operations, a 1 per cent. solution of mercurochrome is painted over the skin of eyelids and face after the part has been thoroughly cleansed in the usual way. Bacteriological investigations have shown this method to be as efficacious as painting with iodine, and no skin irritation is produced as with iodine, this fact being of some importance in eye surgery as the patient is less likely to interfere with the dressings. Before operations the conjunctiva is sterilized by instilling 1 per cent. drops of mercurochrome two or three times on the day before the operation, and once in the hour before the operation.

With the experience of mercurochrome over the period mentioned above, we feel justified in asserting that it is really of considerable value in ophthalmology.

RECTAL PARALDEHYDE AS A PRELIMINARY TO TONSILLECTOMY IN CHILDREN.

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To remove tonsils and adenoids without anaesthesia is by no means a difficult task, as a visit to any of the Continental clinics will prove. Such a procedure has certain advantages, for it obviates all risks associated with the administration of anaesthesia, and also avoids the possibility of the unconscious patient being suffocated with his own blood. Surgeons in this country are thankful for anaesthetics, yet even with anaesthesia the removal of tonsils is no mean ordeal to a child. This ordeal can be minimized considerably by a procedure which aims at "stealing" the tonsils rather than forcibly removing them. Provided no complications supervene, the after-effects of tonsillectomy in children are so slight that they seem to suffer more from fear in the pre-operative stage than from discomfort after the operation. These pre-operative disturbances can effectively be avoided by preliminary medication which makes the child unconscious by the time he is brought to the theatre, and he is thus saved from the various stages that lead to being "put under"—a period of fear and struggle, and not differing very much from that extra minute during which Continental surgeons complete the operation without anaesthesia. The preliminary medication employed is the rectal administration of paraldehyde, a drug which induces a condition very similar to deep sleep. Given in the form of an enema whilst the child is in bed, it can be administered without any struggle, and without any nervous apprehension on the part of the little patient. This preliminary medication has the further advantage that it necessitates very little anaesthetic, and, furthermore, that the return to consciousness is considerably delayed, although the anaesthesia itself is light. By the time the child has fully recovered all the unpleasant after-effects of the anaesthetic have worn off, and many children are under the impression that no operation has taken place.

ROUTINE OF PARALDEHYDE ADMINISTRATION.

The child is admitted the night before operation. A soap and water enema is administered in the morning. An hour later the bowel is washed out, repeatedly if necessary, until the fluid returns clear. The patient is then ready for the administration of paraldehyde per rectum. This, however, should only be given one hour before operation. No other medication is necessary.

With regard to the administration of the drug, the following are important points:

Dosage.—The best results are obtained by the administration of one drachm of paraldehyde per stone body weight. This ensures the child falling asleep rapidly, in many cases before the administration of the drug is completed. The sleep is sufficiently deep for the child not to waken up when carried to the theatre an hour later, and it is quiet and restful.

Vehicle.—The paraldehyde is administered dissolved in stock solution of normal saline, neither warmed nor cooled. One and a half ounces of saline per drachm of paraldehyde should be used.

Method of Rectal Administration.—The paraldehyde solution should not be warmed before administration. The cold solution must be run in slowly, otherwise it will be returned. The stages in the administration are: (1) Pass the catheter, well lubricated, into the rectum. Then lightly plug anal margin with cotton-wool. (2) Fill the funnel and tubing with water, expelling all air, and clip distal end of tubing. (3) Connect to the catheter, release the clip, and run in the solution very slowly. This procedure should take at least ten minutes. The paraldehyde solution should be vigorously shaken before refilling the funnel, to ensure solution. (4) When all the solution has been run into the rectum the catheter is removed, leaving the wool packing in place. A pad of wool is placed on the perineum, the nates are strapped together, and the child is made to lie on his back with his legs together. Sleep always supervenes within half an hour.

A child thus prepared needs little anaesthetic, though no child is sufficiently comatose to be able to dispense with