

concentration of the cresyl blue solution or a partly coagulated drop of blood. A peculiarity was, however, noticed in the case of reticulocytes. In specimens where the red cells were undergoing granular disintegration, reticulocytes stood out prominently without any signs of breaking up. Probably this was due to their reticular structure.

The following modification of Osgood and Wilhelm's method (1934) gave accurate results in counting :—

A 0.5 per cent solution of brilliant cresyl blue in 0.9 per cent NaCl was kept in stock in the ice chamber. When required, small amounts were taken and used for 4 to 5 days. After a time, an initial centrifugalization at high speed for one hour was done to separate out any particles which had precipitated from the stock stain. Blood was taken direct from an ear vein by a needle puncture. One drop of blood and 4 to 5 drops of the stain were thoroughly mixed over a clean glass slide and then taken by a narrow pipette into a Kahn tube containing a small volume (about 1 c.cm.) of sterilized and absolutely clear saline of 0.9 per cent strength. The tube was immediately placed in a water-bath at 37 to 38°C. for 5 minutes. After this, a small drop was taken on a slide, a large rectangular coverslip was placed over it, and the specimen examined under the oil-immersion lens. At least 1,000 to 1,500 corpuscles were counted from one end to the other. Percentages of reticulocytes were then calculated from the total counts. Any slide which showed stain particles along with the corpuscles was rejected without counting. The advantages of this method are :—

- (a) the reticulocytes stained very distinctly,
- (b) the red blood cells remained separate and discrete without showing any tendency towards clumping,
- (c) the specimen remained completely free from any stain particles which previously used to interfere much with the identification of genuine reticulocytes,
- (d) owing to the dilution with saline in the Kahn tube the number of corpuscles in one microscopic field was reduced and thus it became very much easier to count them without the use of an Ehrlich's eyepiece or some similar device as is used by other workers.

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[*Note*.—Dr. C. R. Das Gupta has tested this method, but did not find that it exhibited any advantages over the method (Aii) described by Napier and Das Gupta; also it took longer to carry out.

The method of testing liver extract described by Jacobson is not a generally accepted method for testing the efficacy of liver extracts.—Editor, *I. M. G.*]

FURTHER WORK ON PYRETHRUM IN THE TREATMENT OF PEDICULOSIS

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and

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AMONG the various substances used for controlling the infestation of the head with louse, mention may be made of kerosene, xylol, oil of turpentine, cresol, lysol, acetic acid, etc., but none of them is satisfactory as either it has no action on nits or it causes considerable irritation of the scalp especially when the skin presents an eczematous condition which is so often caused by head-lice.

In a previous communication reference has been made of the good results obtained in the treatment of human louse infestation with pyrethrum (Roy, Ghosh and Chopra, 1941). The important point which came to light may be recapitulated. Pyrethrum prepared in the form of an extract by heating the powder in water or mixed with white vaseline proves fatal to lice, but fails to act on nits. This necessitates the continuation of the treatment during the whole period extending over the incubation period of eggs.

Observations made in Calcutta by the wristlet method indicate that the duration of the egg stage varies from 5 to 8 days in summer and from 7 to 10 days in winter.

It will thus be seen that though pyrethrum used in the forms stated above efficiently acts on adults yet suffers from the disadvantage that it does not act on nits on account of the fact that it cannot penetrate either the egg-shell or pass through the operculum.

We now present a report on the remarkable efficacy of a mixture of kerosene and pyrethrum, or deobase oil and pyrethrum in the treatment of infestation with louse. It has certain definite advantages over other forms of treatment in that only one application is necessary and according to our experience eggs and adults are always destroyed.

As a rule louse infestation among hospital patients is not so common in this country, possibly owing to the free use of oil and practice of taking daily baths. However, a large number of the female patients, all evacuees from Burma, who were admitted into the hospital for treatment of other diseases, had lice in their hair and the infestation was as a rule heavy. This opportunity was made use of to test the usefulness of pyrethrum in louse infestation of the hair. Before the actual tests were undertaken on man, preliminary tests carried out on monkeys had proved encouraging.

In all, 26 patients were treated, 24 being females. The method of treatment followed was the spraying of every part of the hair from the root to the tip with an extract of pyrethrum,

diluted with either kerosene or deobase oil, by means of a De Vilbiss atomizer No. 15. The extract used was Pyresect 25* which was diluted with 24 times its volume of kerosene or deobase oil immediately before use. The taking of a bath within 12 hours following the treatment was in the beginning forbidden, though later observations made it clear that as soon as pyrethrum entering through the operculum came into contact with the embryo inside the egg-shell, the latter was killed, and therefore it would be unnecessary to restrict bathing for more than an hour or so after the treatment. Only one application was required to effect complete cure of their pediculosis in every case.

Laboratory experiments clearly showed that the egg-shell is impermeable to kerosene and also to a mixture of kerosene and pyrethrum. On the other hand, application of a minute drop of the pyrethrum in kerosene or deobase oil on the operculum of nits always destroys the embryo. This is in contrast to the application of kerosene alone in which case a very large proportion of nits so treated will hatch.

* Pyresect 25 was kindly placed at our disposal by the supplier, General Export Co., 1, British Indian Street, Calcutta.

It is clear that pyrethrum is not only toxic to adults but also to nits for which a direct contact is essential. The reason why kerosene acts on adults, though the action is uncertain, but fails to act on nits, is the fact that it cannot penetrate the operculum; this pyrethrum in kerosene or in deobase oil readily does. A marked alteration of the surface tension may be accepted as the explanation. Thus a drop of kerosene poured on water has the tendency to collect in one place, whereas kerosene-pyrethrum will quickly spread over a large area of the surface.

Patients treated with kerosene-pyrethrum mixture have not been known to complain of any irritation of the scalp even when superficial ulcerations were present. It is liked by them on account of its containing a drop or two of oil niroli, which is always added to the mixture in order to make the smell pleasant.

Those with long hair require from $\frac{1}{2}$ to $\frac{3}{4}$ oz. and those with short, less than $\frac{1}{2}$ oz. of the mixture.

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A Mirror of Hospital Practice

GIARDIASIS—TWO CASE REPORTS

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On 20th October, 1941, I was called in to see a female patient, aged 30 years, who had been ailing for more than a year and was suffering from terminal broncho-pneumonia and I was given to understand that she was very seriously ill.

The condition on my first visit was as follows:—

She was very emaciated, toxic, prostrated and dyspnoic. Temperature—103° F. (axillary). Pulse—140, with low volume and tension. Respiration—60 per minute and shallow. Lungs showed signs of broncho-pneumonia. Cyanosis was present. Cough was incessant and hacking with muco-purulent sputum.

Previous history.—She was a mother of 5 children—last issue one and half years back. Complaints started as dysentery one year ago. The symptoms, especially diarrhoea and flatulence, persisted in spite of various treatment. During the whole period of illness she lost about 40 pounds in weight. She was kept on a very low diet.

Treatment and progress of the case.—I put her on M.&B. 693. The temperature was normal on the third day and the lung condition improved, but troublesome diarrhoea started—loose frothy evacuations with mucus about 6 times per hour. The stool was examined microscopically—*Giardia intestinalis* cysts and vegetative forms were found. M.&B. 693 was omitted on

account of diarrhoea and bismuth with opium was given to control it.

On the fifth day the temperature was 99° F. to 100° F., diarrhoea was checked and M.&B. 693 given again but diarrhoea recurred. The stool was again examined; it showed a heavy giardia infection.

Next morning the pneumonic condition having settled down and the patient being free from toxæmia, atebirin 0.3 gram daily was given after food. On the fourth day of atebirin, she passed firm stools twice. On the fifth day she developed atebirin psychopathy and was violently delirious. Peacock's bromide and adalin were prescribed that settled down the condition within 24 hours. She was given an acid mixture and high protein diet. She had no more flatulence and diarrhoea. She gained weight and developed a voracious appetite. Her stools were examined for three consecutive days and no *giardia* was found.

Some time later I had another similar case.

This case was a woman, aged 18 years, after the first childbirth had been suffering from chronic flatulent diarrhoea for one year. She was treated along various lines, on a very restricted diet, with no improvement.

On my first visit I examined the stool microscopically and found giardia, vegetative and cystic forms, in large numbers. No atebirin was available in the market, so she was put on acid mixture and stovarsol. She improved so long as stovarsol was continued, but diarrhoea recurred when the drug was discontinued.

With great difficulty one phial of atebirin was procured by the patient's relative at a fabulous price. She was cured with one course only. Stool was repeatedly examined but no giardia was found.