THE PREVENTION OF ENTERIC FEVER IN ARMIES.

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WHEN I proceeded to Bermuda as senior medical officer, Surgeon-General Jameson, C.B., the Director-General Army Medical Service at that time, directed my attention to the great prevalence of enteric fever there, and requested me to spare no pains in my efforts to cope with it.

After being in Bermuda a year or so, I arrived at the conclusion that the dry-earth latrines were responsible for nearly all the cases which occurred in barracks—by inhalation or deglutition, when using the latrines, of the germs—so, acting on this conviction, I strenuously advocated their total abolition from all the barracks in the islands, and the introduction of the water-carriage system.

My recommendations were approved of by the General Officer Commanding Sir George Barker, K.C.B., Colonel Moore, C.R.E. (the pioneer, I believe, of the water-carriage system in Bermuda), and by his successor Colonel Bor, C.R.E., who most ably supported me throughout a very difficult (and expensive) undertaking. Some considerable time necessarily elapsed before the dry-earth latrines could be done away with, so it was incumbent on me in the meantime to render them as little pernicious as possible.

This was done by disinfecting every portion of the latrines and urinals with a 10 per cent. solution of carbolic acid applied in large quantities by means of a watering-pot and rose once or twice a week, and when the water-carriage system was established the same process was continued but less frequently.

In connexion with this the following table will, I think, be of interest:—

Year.	Average Annual Strength.	Admissions for Enteric Fever.	Deaths from Enteric Fever.	Remarks.
1895	1,447	107	20	
1896	1,385	27	4	
1897	1,521	34	7	
1898	1,730	26	4	In the year 1900 of the 1,444 troops 816 were West Indian.
1899	1,781	20	0	
1900	1,444	8	0	

In 1897 all filters in barracks were abolished, and in 1899 boiling the drinking water was no longer resorted to, as I considered filtering and boiling unnecessary with the water supply we had—rain water collected on catches stored in tanks and kept in a good sanitary state.

Undoubtedly boiling the water for drinking purposes is essential under certain circumstances, but I question its utility in preventing to any great extent the incidence and spread of enteric fever in barracks or in the field.

I lay much more stress on keeping the latrines, etc., in a perfect sanitary condition, but I know from experience what a very difficult duty this is; the medical officer must give the matter his personal superintendence, and to do it effectually his sanitary zeal must be above the average. I hold that the sedentary life and close atmosphere on board ship predispose soldiers to enteric fever; so, also, does the vitiated air of tents, which may account for enteric fever being so prevalent amongst recent arrivals at a foreign station, and its breaking out so frequently on going into camp from barracks.

The fact of men being so thirsty as to drink muddy and dirty-looking water rather than wait for pure water, suggests to me that Nature may only be asserting herself, the demands of the system being paramount, and that to withhold water under such conditions is, paradoxically speaking, to add fuel to the fire. May not the liquid, perhaps, be salutary, by distending the intestines and serving as a medium for any micro-organisms already introduced to float in and pass away with the excreta; and may not the contrary, the comparative emptiness of the canal and probable apposition of its walls, tend to foster them?

Again, may not the secretion or excretion of the bile with its antiseptic and germicidal properties be thereby checked? Possibly there would be no enteric fever if the liver acted healthily.

THE DISINFECTION OF NEW CLOTHES.

By SIR CHARLES A. CAMERON, C.B., M.D.,
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I HAVE been able in several instances to satisfy myself that new clothes were the vehicle of the infective matter of scarlet fever; but I shall only mention one of them.

A young lady, residing in a sequestered part of the county of Wicklow, contracted scarlet fever. No case of the disease had for a long time previously occurred in or near the district, and the young lady had not been from home for several months. Her mother had been three times in Dublin shortly before her daughter's illness. On each occasion her visit was to a dressmaker, and on the last visit she brought home a new dress. It was handled and admired by her daughter, who soon after became ill from scarlet fever, a disease from which her mother and all the other members of her family had suffered several years before. Circumstances led me to inquire into the origin of the infection, and I ascertained that in the family of the dressmaker there was a severe case of scarlet fever. It was admitted to me that the making of the dress had been chiefly carried on in the room in which the patient was located. There seems to be little room for doubting that the dress was infected by this patient, and that the *materies morbi* infected the lady's daughter. I could describe many similar cases.

The recruits of the Royal Irish Constabulary are located in a large barracks situated in the Phœnix Park, Dublin. The barracks are large, well ventilated, and provided with the most approved sanitary accommodation, and are situated in a park, yet for many years past the recruits have been peculiarly liable to contract scarlet fever, from which disease the other inmates of the barracks rarely suffer.

The clothes of the recruits are largely made by women for the contractor who supplies them to the constabulary. It occurred to me that the new clothes supplied to the recruits were probably the means of conveying infection to them. Accordingly, I recommended that the clothes should be sterilised before they were received into the barracks. The recommendation was adopted, and apparently with a good result. The sterilisation commenced at the end of April, 1901, and the following shows the number of cases of scarlet fever in each month of that year and the previous one: 1900—January, 3; February, 7; March, 2; April, 4; May, 1; June, 4; July, 3; August, 1; September, 0; October, 3; November, 4; December, 11. 1901—January, 6; February, 10; March, 9; April, 6; May, 4. From May 15th up to the present (January, 1902) no further cases have occurred.

It would be desirable to have all clothes, made by tailors and dressmakers, sterilised, and certificates given that they had been subjected to that process before the articles were sent home. The cost of sterilising is trifling, and the process could be carried out in the disinfecting stations of the sanitary authorities or by private persons provided with the necessary appliances. No doubt some articles of ladies' apparel might be injured by the process, but they would be exceptional.

ON DIPHTHERIA ANTITOXIN ERUPTIONS.

By ARTHUR STANLEY, M.D., B.S.LOND., D.P.H.,
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THE following observations were made on a series of 500 cases cases of diphtheria during two years' work in a diphtheria ward at the North-Western Hospital of the Metropolitan Asylum Board. All the cases were treated with antitoxin, and the diagnosis of doubtful cases was verified by bacteriological examination. The total number of deaths in the series was 80, a death-rate of 16 per cent. The antitoxin was

prepared at the laboratories of the Royal Colleges of Physicians and Surgeons in London, and was injected in quantities usually of 4,000 Behring antitoxin units immediately after admission, but varied from 1,000 up to 30,000 units according to the severity of the case, and the time of admission after onset. No constant relation between the quantity of antitoxin given and frequency of eruption was noted, but in one case, where antitoxins from two different sources were injected at the same time, two separate antitoxin rashes were observed; the first occurring ten days and the second fourteen days after the giving of the antitoxins. No special sources of antitoxin were found to cause a preponderating number of eruptions, and the eruptions occurred steadily throughout the two years I was working with diphtheria.

Diphtheria Antitoxin Eruptions.

Cases of diphtheria receiving antitoxin	500
Antitoxin eruptions	112
Erythemata	58
Erythemata+urticaria	15
Urticaria	30
Scarlatiniform	6
Morbilliform	3
Transient early erythema and urticaria (usually at seat of injection)	17

Average day of onset of eruption:

Erythemata (varied from 4th to 29th day)	12.2
Urticaria (varied from 4th to 19th day)	9.2
All eruptions	10.8

Skin eruptions appeared in about a fourth of the cases. The period of onset was usually during the second week after the giving of the antitoxin. The eruption met with was not so peculiar as to be pathognomonic, but was sufficiently marked, especially in relation to the general symptoms as to constitute a distinct type.

The typical diphtheria antitoxin eruption is a marginate erythema on the psoriasis regions tending to run into arcs of a circle, lasting about three days, and accompanied by slight *malaise*, and a rise in temperature of about 3° F. The margins of the erythema are raised and turgid, and may be made up of arcs of circles of widely varying diameter according to the phase of spread of the lesions, which, beginning in macules, become rings, increasing in diameter, until the adjacent rings coalesce and break the arc. There is usually some transient light-brownish red pigment left by the evanescence of the eruption.

The spread of the rash is most frequent from face and trunk to limbs, and from extensor to flexor surfaces. The eruption lasts from two to five days, but may in cases of an urticarial or scarlatiniform nature last a few hours only. There may be a little desquamation after severe and prolonged erythemata, but there is rarely any confusion between true scarlet fever occurring in the course of diphtheria and eruptions produced by antitoxin.

The general symptoms, beyond a rise of temperature of some 3° F. and its accompanying *malaise*, are not marked. Pains in the joints have been frequently described but were not observed in one of these 500 cases. This result may have been due to the cases being chiefly among children. The only marked case in which pain was present was a girl of 13, who had frontal headache and lumbar pain extending down the thighs. She had a marginate erythematous eruption, and the temperature rose to 101° F.

I injected myself on two occasious with 4,000 units of antitoxin into the leg, and had after the first injection some immediate itching erythema followed by severe pain in the leg, thighs, and lumbar region lasting a week. There was no antitoxin rash.

The greater number of rashes follow this type. In the most common variation the erythema lesions are raised into wheals. These urticarial lesions appear to be erythemata in which the subcuticular exudation is excessive, and the wheals last longer and leave redder patches than ordinary urticaria. Most of the so-called urticarias fall into line with the above-described type rash, which is an erythema marginatum. Quite frequently a rash, which begins as urticaria, passes gradually into typical erythema marginatum without the occurrence of new lesions.

The erythema lesions may be very small and punctate, and may conglomerate so as to closely resemble scarlet fever, or they may consist of roundish measly macules, pinker than measles, though closely resembling rötheln. Sometimes the same eruption was like measles on the face and neck, like scarlet fever on the trunk, and was a typical circinate erythema on the extremities.

Two cases, which contracted scarlet fever after admission for diphtheria, had typical ringed erythematous antitoxin rashes. One of these cases had scarlet fever four days after admission with diphtheria, which was followed two days later by a typical ringed erythematous antitoxin rash. The other case had scarlet fever seven days after admission with diphtheria, which was followed on the fourteenth day after admission by a ringed antitoxin erythema.

The rash, which in the typical cases is limited to the psoriasis regions—trunk and extensor surfaces of the limbs—may become quite general. The buttocks are almost invariably affected by the eruption.

Transient early erythematous blushes and also urticaria often occur soon after the injection of antitoxin, but these may be generally considered to be of traumatic origin, and not to be related to any specific property of the antitoxin. The area of skin before injection was sterilized with soap and carbolic lotion, and the injection syringe was boiled before each injection. No abscess at the seat of injection occurred.

The occurrence of an antitoxin eruption during the course of a case of diphtheria did not appear to influence the prognosis seriously, though it cannot but be held that any febrile disturbance of the heart would tend to have a harmful effect. No case, however, was observed where fatal heart failure was precipitated by the occurrence of an antitoxin eruption.

TREATMENT OF CHRONIC ECZEMA.*

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IT is certain that as our knowledge of bacteriology and pathological processes increases the term eczema will be less frequently employed or more frequently qualified by an adjective indicating its causation, etc.

It is impossible to separate the consideration of the treatment of chronic eczema from that of its causation. It is obvious that if a condition called eczema be produced or kept up by the presence of micro-organisms, as in what we still, correctly I believe, call impetiginous eczema (but which I am quite prepared to call staphylococcogenic dermatitis), we must kill, or at least check the growth, of these micro-organisms by suitable germicides. But if eczema be due to other causes than germs, even though such appear as a complication, we must try to discover that cause if we would permanently relieve or cure a patient. We may safely at present assert that the contention that eczema is always of parasitic origin is not yet definitely proved, but that germs soon appear and look suspiciously like a cause, and at least form a complication, I have convinced myself by frequent histological and bacteriological examinations. We see every day that toxins flowing over the skin from the ears, eyes, nose, abscess cavities and scabs can scald, so to speak, and produce an eczematous condition. It appears to me fortunate that the germs found in connection with eczematous conditions, whether as cause or complication, generally remain superficially situated, and, therefore, within reach. The great importance of keeping this in mind can be easily illustrated by a single case, which will show its bearing on every day practice.

Case of Relapsing Eczema.—A lady had had severe and almost general eczema upwards of a year, and had been unable to obtain satisfactory lasting relief. I was fortunate enough to be called in, although the lady had begun to think herself incurable. Many patches of skin were thickened and very pruriginous, while others were moist, or crusted in such a way as to suggest that the skin required rest and protection. I fetched my glue-pot containing Unna's zinc gelatine, because I felt certain that the zinc gelatine would prove an invaluable remedy for such a severe, raw, smarting case. The moment the lady saw it she exclaimed: "That is Unna's gelatine stuff; I cannot bear it. Mr. So-and-So—mentioning her last attendant's name, one of the ablest surgeons of our day—tried it and it utterly failed." I asked her how the gelatine dressing had been applied, and she told me it had been heated and painted on the affected surfaces and then dabbed with cotton wool. In answer to the question whether anything had been done to the skin before the gelatine was applied by way of preparation she said No. Then I informed her that that was just the secret in her case, and that I intended to carefully pre-

* A paper read before the East Anglian Branch of the British Medical Association.