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ON THE  
PREVENTION AND TREATMENT  
OF SCARLATINA

AND  
OTHER INFECTIOUS DISEASES

BY THE  
INTERNAL ADMINISTRATION OF DISINFECTANTS

BY  
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ON THE

# PREVENTION AND TREATMENT OF SCARLATINA, ETC.

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THE limits of this paper forbid any discussion of the relative merits of the various theories entertained regarding the nature of the poisons of infectious diseases. This is of the less importance, however, as the principal object I have in view in the present communication is to record certain facts, which, whether they be in harmony or at variance with a theory, cannot have their truth or practical value in any way affected thereby. The following fragmentary remarks are introduced merely to lead up to the line of practice adopted and advocated.

The whole phenomena in infectious diseases are, I believe, best embraced and explained by the germ theory. Whether the minute particles of living matter which constitute disease-germs consist of animal or of vegetable bioplasm, is a question which remains to be solved. Probably the latter view is the correct one. There certainly does appear to exist a close analogy between the behaviour of such disease-poisons on the one hand, and ferments on the other.

On this hypothesis we can readily understand how certain chemical agents, which have been found to destroy the life or inhibit the activity and multiplication of those organisms which are invariably associated with fermenta-



tion and putrefaction, and coincidently, if not consequently, to arrest these processes themselves, should have been successfully employed to prevent the spread of infectious diseases.

It has thus, long, been the practice to subject to the influence of such agents as permanganate of potash, chloride of lime, sulphurous acid, carbolic acid, &c., all liquid and solid substances supposed to be impregnated with the poison of an infectious disease. And striking results have been obtained by mixing the air itself—the medium through which the minute germs might be wafted into the body—with disinfectant gases.

A very universal accord has long been, and still is, given to the belief that by such means infectious diseases can be more or less disarmed of their virulence, limited in their spread, or even altogether prevented.

When fever breaks out in a house, a sense of comparative security accompanies the free and judicious use of disinfectants. Even the prudent physician is careful, in such a case, before leaving the sick-room, to wash his hands with Condyl's fluid or carbolised soap.

Supposing, however, that our means of disinfection, external to the body, were perfect, it would still be impossible to keep an individual, in all his surroundings, perpetually thus protected. We are constantly called upon, not merely to prevent the spread of disease, but to cure actual attacks which threaten life. Attention has, therefore, been much directed of late to the following question. When a case of infectious disease has actually occurred, can any disinfecting influence be brought to bear upon the disease-germs within the body? Is it possible, in short, to disinfect the living tissues? Admitting the analogy between disease-action and putrefaction or fermentation, it must be allowed that, if we can so



disinfect the tissues of a living animal, that when it is put to death they will resist putrefaction, there is no reason why we should not hope to be able by suitable means to arrest or prevent a zymotic disease.

Professor Polli, of Milan, administered to animals, without any ill effects, large doses of the sulphites of the alkalies and alkaline earths. These animals were killed, and it was then found that, whilst an animal killed under ordinary circumstances rapidly putrefied, those animals to which the sulphites had been administered showed no signs of putrefaction.

Dr Sansom fed two guinea-pigs "with pills composed of arrowroot mixed with sodium sulpho-carbolate. No other food was given. In four days the little animals had consumed 275 grains of the salt. No obvious effect was produced, except a slight looseness of the evacuations." The animals were then killed, and it was found that "the flesh showed a marked tendency to resist putrefaction."\*

In the Royal Hospital for Sick Children, and more recently in the scarlet fever wards of the Royal Infirmary, I have for some years had considerable opportunities of studying scarlet fever. It has been my practice to leave the disease to follow its natural course, and to content myself with the treatment of symptoms or complications when these called for interference. Last autumn, however, a succession of very severe and rapidly fatal cases occurred within a short period. I then determined to test fairly the value of the internal administration of disinfectants; for this appeared to me to be the only method of treatment which had any theoretical value to recommend it. Of the various substances employed for this purpose, the sulpho-carbolate of sodium, originally proposed by Mr Crookes, and afterwards more widely

\* "The Antiseptic System," p. 330.



introduced by Dr A. E. Sansom, seemed to be the most suitable. The advantages of this salt may be gathered from the following account of its action, which is given by Dr Sansom in his valuable work on "The Antiseptic System:"—

"It was found that twenty-grain doses of sodium sulpho-carbolate could be readily administered to adults. So free from taste was the solution that many said it seemed only like water itself. The dose was increased in several cases to sixty grains, administered every four hours. The only direct effect noted was a slight tendency to vertigo or dizziness. The odour of carbolic acid could be readily detected in the breath. The urine of a patient who had taken 360 grains of sodium sulpho-carbolate in twenty-four hours, was collected and examined. It presented no evidence of the presence of carbolic acid, but contained a considerable quantity of sodium sulphate. It showed a marked tendency to resist putrefaction.

"It would appear, therefore, that sodium sulpho-carbolate administered to a living animal is rapidly absorbed and projected throughout the system. In the blood or the tissues the double salt is decomposed, the sodium sulphate being set free in the tissues, and ultimately excreted by the kidneys; the carbolic acid, also liberated in the textures eventually, for the most part escaping by the lungs. It is probable, also, that some portion of the carbolic acid is eliminated by the urine. It follows that the administration of sodium sulpho-carbolate is an indirect means of administering carbolic acid; and inasmuch as at least one-fourth of the weight of the sulpho-carbolate employed consists of carbolic acid, we find that an amount equalling from fifteen to ninety grains per diem can be administered of the latter. It is obvious that the direct administration of this amount of carbolic



acid would, from its nauseous character and its difficulty of manipulation, be not readily accomplished; and there would be a danger of the toxic action of the latter being manifest—a result which does not occur when the sulphocarbolates are administered. One would imagine that, in this latter case, there is a gradual evolution of carbolic acid, which at no time is in sufficient amount to manifest its poisonous action.” \*

Commencing with moderate doses of the sodium sulphocarbolate, I soon found that, as stated by Dr Sansom, from twenty to thirty grains every two hours, could be easily taken by adults for a considerable length of time, without any inconvenience or physiological disturbance of any kind.

I have never in any case encountered vertigo, dizziness, or any symptom that could fairly be attributed to the salt. For the last seven months, every case that has been brought into the Infirmary, or has occurred in my private practice, has been at once put on this treatment. I have now treated upwards of sixty cases in this way, without having had one death.

The following is an analysis of fifty cases so treated in the Royal Infirmary. Of these not one failed to make a perfect recovery. Nineteen were males, and thirty-one females. Their average age was 17·5 years. The average duration of the disease before treatment was commenced was 4·4 days. Dating from the outset of the disease, convalescence with normal temperature had commenced:

In 18 cases in 6 days.

„ 18	„	„	8	„
„ 5	„	„	10	„
„ 4	„	„	14	„
„ 2	„	„	17	„

\* “The Antiseptic System,” p. 330.



In only three cases was recovery long delayed by sequelæ, and in these the sodium sulpho-carbolate treatment was commenced on the sixth, tenth, and fourteenth days of the fever respectively,—too late to prevent the after-effects of the disease. In forty cases no complication interfered with the quick and quiet subsidence of the fever. Albuminuria was observed in five cases: in three of these it amounted merely to a passing trace; in the remaining two it was persistent, and accompanied with blood and renal casts. These two cases are included in the three above mentioned, in which the treatment was commenced late. Rheumatic pains, which were easily controlled, occurred in three cases. In three there was inflammatory swelling of the cervical glands, which in one strumous child resulted in abscess. In only two cases was any delirium noted: in one it was severe; in the other very mild. In forty-six cases the temperature and pulse fell steadily after the treatment was put in force. In only four was any rise over the first recorded evening temperature noted; in all of these it was insignificant in amount, and of short duration. Only one case came under treatment on the first day of the disease; the eruption was coming out and was well marked. There was another case of scarlet fever in the same house. Treatment was at once commenced, and next day the eruption had disappeared, and the pulse and temperature were normal, and remained so. In another case, on the ninth day of the disease the medicine was suspended, the supply having run short. On the same evening, the temperature, which both on that morning and on the previous evening had been  $100^{\circ}$ , rose to  $103^{\circ}$ .

The patients who are taken into the Royal Infirmary are for the most part adults. But that the disease does



not always run a mild course in such cases may be inferred from the fact, that of twenty-four patients admitted into the scarlet fever wards of the Infirmary during August, September, October, and November, 1874—the four months immediately preceding the commencement of the treatment by the sodium sulpho-carbolate,—no fewer than six died.

Up to this point, the results I have obtained by this method of treating scarlatina entirely support the favourable opinion which Dr Sansom formed of it from his own experience. I have, however, ventured to go still further than, in so far as I am aware, any one who has used internal disinfectants has hitherto gone. So marked an influence did this remedy seem to exert on the actual disease, and so well was it tolerated in full doses, and for a considerable period, by all my patients, old and young, without exception, that *I determined some time ago, whenever I met with the disease in my private practice, to give the sodium sulpho-carbolate to all individuals exposed to the infection who were not protected by a previous attack.* For I argued, if by internal disinfectants we can destroy or inhibit fever-germs after they have multiplied indefinitely, and produced their pathological effects within the body, may we not reasonably hope that, by previously disinfecting the tissues of the body, the germs which first find their way into them will be much more easily destroyed or paralysed? I therefore hoped thus to be able either to modify or prevent attacks of infectious disease.

To be able so to control the activity of the disease-germs on their entrance into the body, that the resulting attack should with certainty be rendered mild and safe, instead of severe and dangerous, and the patient thus be protected against a future attack, appeared to me



the more desirable end to be aimed at. For to prevent the attack altogether, however desirable this might be at the time, would be to leave the individual still liable to the disease. The results which I have up till now actually obtained have exceeded my utmost anticipations, and require, I am fully aware, to be recorded and received with due caution.

I have administered the sulpho-carbolate of sodium for the above purpose in doses varying, according to age, from five to thirty grains three or four times a day, and sometimes, when well borne, more frequently, to those exposed to the poisons of scarlet fever, diphtheria, and measles. It was given in seven families to twenty-two individuals exposed to the poison of scarlet fever; in three families, to fifteen individuals exposed to the poison of diphtheria; and in three families, to eight persons exposed to the poison of measles. The diseases have not in a single instance extended beyond the individuals first affected. In the cases of scarlet fever, the patients, as well as those exposed to infection, were treated with full doses of the sulpho-carbolate; and in this way the infection may have been lessened. The cases of diphtheria and measles were treated on ordinary principles, and the absence of any spread of the diseases in these instances must be attributed either to accident or to the protection afforded by the sulpho-carbolate. I think it right, however, to mention that, although the mortality from scarlet fever has been considerable during the last eight months, I have been informed by several of my professional brethren that cases have not been uncommon in which the disease has remained confined to the member of the family who first took it, and that in some instances the other children, although freely exposed to the poison, have all escaped. I am therefore far from feeling that I have proved, even



to my own satisfaction, that by the internal use of a disinfectant we can entirely prevent or modify attacks of infectious disease. The results I have obtained in the above cases are, however, I think, sufficiently remarkable to be recorded, and I now publish them in the hope that during the severe epidemic of scarlet fever which we are likely to encounter during the coming autumn and winter, the plan which I propose, and have to a limited extent tested, may be fully and fairly tried. The question has this further interest attaching to it—that upon its success or failure hinges the whole question of the value of internal disinfection. For if this method is not decidedly effectual at the very outset of the disease, when the poison is small in amount and quiescent, can we expect much benefit from it after the disease-germs have multiplied enormously, and their mischievous effects upon the system have commenced? I have as yet employed only the sodium sulpho-carbolate for the purpose of internal disinfection. Other substances may yet prove equally or more useful, and the plan should be applicable to all the so-called zymotic diseases.



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