

bronchitis, gastritis, colitis, haematemesis, bleeding from the bowel, acute and persistent vomiting, acute and persistent diarrhoea, dacryocystitis, conjunctivitis, albuminuria, and hystero-epilepsy.

In these epidemics poison gas workers show a very great degree of immunity from influenza, as only 1 per cent. were affected, while in the panel practice of the medical officer to the factory no less than 24.8 per cent. were victims during the two epidemics.

In three other centres where workpeople are engaged in chlorine processes it was found that influenza during the last epidemics was practically a negligible complaint, although, as in the previous instances, it was very prevalent in these districts among the general community. The conclusions arrived at by medical officers attached to these three factories were that not only was the disease very rare among this class of workpeople, but that when cases were contracted they were of a mild type.

Chloro-picrin workers are also found to be less susceptible to infection than the general community. In the North Midland district there are two factories, employing about 650 workpeople, where this substance was manufactured, and where filling was also carried on. Among this number only one or two cases of influenza arose in each district, and these were of a very mild type. Without exception, each person was able to return to work after being absent for eight or not longer than ten days.

Other lethal compounds were manufactured or handled in five different centres, and the information I have from these districts tends to show that workers in these compounds also are practically immune from influenza. At a large factory where upwards of 3,000 people were employed, and to which whole-time medical officers were attached and full records kept, it was found that while the general body of workpeople suffered from influenza to the extent of 50 per cent. in each epidemic, among the poison gas workers only 1.3 per cent. were reported as incapacitated on this account. At a second factory where similar bodies were manufactured not a single case of influenza arose. At the other three centres where these compounds were made comparatively few cases of influenza were found, and not a single case of pneumonia arose among any of this class of workpeople.

Among workpeople employed in the production of mustard gas the records show that the amount of absenteeism during the two epidemics was not increased beyond normal. The medical reports of over 1,000 workpeople indicate that in the production of mustard gas the average weekly percentage of absenteeism from all causes is about 1.3 for man and woman alike, and during the recent epidemics of influenza this figure remained practically stationary.

It has been found, however, that workpeople engaged in the production of phosgene gas are more prone to influenza infection than other classes of the community, although pneumonia does not arise more frequently among these workers than among other classes of patients. When bronchitis arises as a complication of influenza among phosgene workers it is invariably of a severe type, and may develop into bronchopneumonia.

The information with regard to influenza among poison gas workers has been collected from twenty different sources in different parts of the country; it all points in the same direction—that, with the exception of phosgene gas, workers engaged in the production of other poison gases have enjoyed a very high degree of immunity from influenza infection. It is agreed, on the other hand, that phosgene workers are peculiarly susceptible to influenza, and that the disease, when contracted, assumes a serious course.

At a recent meeting of the Société de Thérapie, Paris, Dr. G. Rosenthal commented on Rénon and Mignot's recent communication, in which they stated that injections of saccharose had no action either on human tuberculosis or on the experimental diseases in the guinea-pig (vide BRITISH MEDICAL JOURNAL, March 15th, p. 308). This objection, he said, was only applicable to hypodermic injections, which, as already stated, possessed little value. On the other hand, a daily intravenous injection of 5 to 20 c.cm. of Lo Monaco's solution (equal parts of saccharose and water) was efficacious in states of malnutrition, and indirectly had a favourable action on tuberculosis. The improvement was usually rapid, being well marked after ten to fifteen days' treatment.

ANTIMONY IN THE TREATMENT OF AMERICAN LEISHMANIASIS OF THE SKIN.

BY

GEORGE C. LOW, M.A., M.D., C.M., M.R.C.P.,

PHYSICIAN, ALBERT DOCK HOSPITAL, LONDON SCHOOL OF TROPICAL MEDICINE; TEMPORARY MAJOR I.M.S.

It is unnecessary to enter here into the history of the introduction of intravenous injections of antimony (tartar emetic) in leishmaniasis and other tropical diseases. I would refer those interested in the subject to a paper by myself published in the *Transactions of the Society of Tropical Medicine and Hygiene*, December, 1916, and to one by Jemma in the *Journal of Tropical Medicine and Hygiene*, January 1st, 1918.

Cases of American dermal leishmaniasis are not commonly seen in England, and that here recorded is of special interest because of its long duration and because no secondary buccal lesions have developed, a contingency always to be dreaded.

History of the Case.

The patient was born in Scotland, and served in the Indian army for thirty-three years (1876-1909). After leaving India he went to Portuguese West Africa for a trip; in 1909 and again in 1910 he visited Central America, travelling on the frontiers of Guatemala and British Honduras. He returned to England in July, 1910, and remained until October, 1910, when he went to Portugal. Since that date he has been in Portugal for the greater part of every year till 1917; he visited San Thome for a trip in 1912. From 1917 to the present date he has lived in London.

Previous Illnesses.

When in India he suffered from dysentery (1877-78) and from malaria in 1903. In 1880, when at Secunderabad, he had two sores on the left hand between the ring and middle fingers. They were of chronic type, and lasted for about a year, finally disappearing when he left Secunderabad. In Burma, in 1884, he had "mud sores" on the ankles. In 1889 and 1890 he was back in Secunderabad; sores on hands again. Their nature is doubtful. They disappeared without treatment. He had an attack of quartan malaria in British Honduras, 1910. He has never suffered from syphilis.

Present Illness.

When in British Honduras he was constantly travelling in the jungles and forests and was much exposed to the bites of all kinds of insects. Between April and July, 1910, he developed *Gusano del monte*—that is, an infection with the larvae of *Dermatobia cyaniventris* (= *D. noxialis*). Thirty maggots were removed from various parts of his body.

In October, 1910, when in England, he noticed a horny, oval, yellowish scale, $\frac{3}{4}$ in. by $\frac{1}{2}$ in. on the pinna of the right ear. He picked it off, leaving an open sore which showed no signs of healing. In January, 1911, he suffered from influenza followed by pneumonia, and at this time the sore became larger. Mercurial ointments were then tried, but did no good. Although the Wassermann test gave negative results in 1912, he took a course of mercury and potassium iodide spread over a period of five months (during his stay in San Thome of three months and the voyages out and home), with no result, the sore continuing to perforate the ear till it formed a complete passage, when it continued to spread round the edges. In 1911, when in Portugal for the winter, the sore became much worse and the lower part of the ear became very much swollen. The condition was then diagnosed as malignant disease, rodent ulcer, and syphilis by different observers.

In May, 1913, the patient saw Professor Simpson in London. Dr. Wenyon, at the London School of Tropical Medicine, was requisitioned to make cultures from the sore for leishmanial parasites, and *Leishmania americana* appeared after a long period of incubation. Sir Ronald Ross then tried radium, but this failed to cure the condition. On the patient's return to Portugal in 1914 Dr. Pereira da Silva cauterized the lesion and some superficial ulcers around it. Professor Kopke later recommended antimony, but this treatment was not carried out. From that date (1914) till the present time the condition has remained more or less unaltered, but a portion of the ear has been gradually eaten away. In June, 1918, the part became inflamed and the sore threatened to spread again. Antimony ointment was applied locally. It did good, the sore drying up considerably. Apart from this he has never had any other antimony; the ointment was applied from July 17th to 22nd, 1918.

In August, 1918, Professor Simpson suggested that he should be given antimonium tartaratum intravenously and asked me to give the injections. For this purpose I took the patient to the London School of Tropical Medicine and gave him a course, the result of which will be seen later.

Condition on Examination.

About an inch of the pinna of the right ear was gone; the area was dry except at the top, where, and also at the lower margin, there were signs that the disease still existed and was spreading. The part was tender and red. The diseased margin was punctured, and smears and cultures made from the serum and blood withdrawn. The results of both were

negative, but owing to the facts that leishmanial bodies had been found before, and that clinically the condition was characteristic and active, the injections were proceeded with. Besides the finding of the leishmanial bodies, the diagnosis was supported by the fact that the case originated in Central America, and assumed the form characteristic of the disease in those regions (*oreja de los chileros*). See descriptions by H. Seidelin (*Yellow Fever Bulletin*, vol. ii, No. 9, 1912), quoted by Julian Arce, Dermal Leishmaniases of Peru (*Boletín de la Sociedad Geográfica de Lima*, xxxiii, 1916), and Rodríguez Arjona (*Rev. Med. de Yucatan*, vol. x, April-May, 1915), quoted in *Tropical Diseases Bulletin*, vol. vii, No. 2, 1916. No signs of any implication of the mucous membrane of the nose or mouth could be detected. The Wassermann reaction was negative.

Table showing Number and Results of Intravenous Injections of Antimonium Tartaratum.

Date.	gr.	Date.	gr.
Aug. 12, 1918	gr. 1	Oct. 28, 1918	gr. 2
" 15 "	gr. 1	" 31 "	gr. 2
" 19 "	gr. 1	Nov. 4 "	gr. 2
" 22 "	gr. 1	" 7 "	gr. 2
" 26 "	gr. 1	" 11 "	gr. 2
" 29 "	gr. 1	" 14 "	gr. 2
Intermission.			
Second Course.			
Oct. 3, 1918	gr. 1	Dec. 2 "	gr. 2
" 7 "	gr. 1	" 5 "	gr. 2½
" 10 "	gr. 1½	" 9 "	gr. 2½
" 14 "	gr. 1½	" 12 "	gr. 2½
" 17 "	gr. 1½	" 16 "	gr. 2½
" 21 "	gr. 1½		
" 24 "	gr. 2	Total	gr. 47

Remarks.—There was a slight rigor after the first dose on August 12th. On August 29th the ear looked better and was much drier. On October 3rd, at the commencement of the second course, the improvement was maintained; there was no sign of spread. All signs of inflammation had gone by October 14th. There was a rigor after the injection on November 4th; on the 18th the ear looked as if it were cured.

The injections were given by the late Dr. Cockin and myself. The tartar emetic was dissolved in 2 oz. of normal saline, sterilized, and run into the vein as near as possible at body temperature. The intermission in the course was due to the illness of Dr. Cockin and to my absence from London. It was not intended for any curative or other reasons. The injections were well borne, and, apart from a rigor twice, probably due to the solution being a little cold, there were no untoward symptoms.

The effect upon the lesion was striking; a very distinct improvement was noticeable on August 29th after the fifth injection. For all practical purposes the ear was cured on November 18th, but to make certain the injections were carried on for another month, to December 16th; a total of 47 grains in all having then been given.

Since that date I have examined the condition from time to time and no signs of any recrudescence have appeared. On January 2nd, 1919, the ear looked perfectly well, the margins were fibrosed, he could stand the part being pinched, and could sleep on it, a thing he could not do before. I saw him again on February 17th, when the part was still well; on March 6th it was evidently quite cured. All the mucous membranes are healthy.

ANTIMONY TARTRATE IN BILHARZIOSIS AND TACHYCARDIA.

BY

J. B. CHRISTOPHERSON, M.A., M.D.,
F.R.C.P., F.R.C.S.,
DIRECTOR OF THE CIVIL HOSPITALS OF KHARTOUM AND
OMDURMAN, SUDAN.

I HAVE been told that, in some cases which have undergone courses of treatment by the intravenous injection of antimony tartrate, "tachycardia" was noticed; this suggested that antimony tartrate for bilharziosis was a dangerous remedy because it produced cardiac symptoms.

Sweeping general statements such as this are often made by people who have not given the remedy a real trial. They are inclined to attribute any unexpected symptom which occurs in the course of treatment and after to the action of the drug. Many mistakes are made in medicine by such hasty conclusions.

I have always advised that antimony tartrate should be given in both bilharziosis and leishmaniasis with circumspection, and with due appreciation of the fact that it is

a powerful agent for good or evil, according to the skill and acumen of the operator; but nevertheless it may be administered safely by the circumspect* doctor in his out-patient clinic with sure effect in the ordinary uncomplicated case of bilharziosis.

Tachycardia, or rapid heart (accelerated beat), is quite common amongst Egyptians, as is well known to doctors who do insurance work, and I have no doubt that some of the cases treated with antimony tartrate have tachycardia. But this symptom is not due altogether to the remedy.

The patients referred to above were Egyptian army soldiers. I am told that tachycardia is a common cause for the rejection of recruits for the Egyptian army, so possibly the tachycardia had nothing to do with the antimonium tartrate; indeed, it was first noticed some weeks after they had been discharged from hospital, and other possible causes of rapid heart had not, in this particular instance, been investigated. Many soldiers are excessive cigarette smokers; some of them have hypertrophy of the left ventricle, with a certain amount of heart strain, owing to military exercises. Here are two explanations which might account for the tachycardia, and they should be, in my opinion, excluded before antimony is blamed. Now I come to a third possible cause. The Egyptian soldier is—though big and muscular—sallow-skinned and anaemic, and this condition is due to the parasites he harbours in his intestines and elsewhere. *Schistosomum haematobium* is only one of the most common of them. *Ankylostoma duodenale* is equally common. *Amoeba dysenteriae*, *Taenia nana* and other tapeworms, *Ascaris lumbricoides*, threadworms, *Heterophyes heterophyes*, *Lambliia intestinalis* and other flagellates, bacteria, and micro-organisms—any, some, or all together may be present in the bowel of the Egyptian—and more than these. The Egyptian soldier is no exception; he is infested with intestinal parasites.

Until intestinal parasites are looked for systematically and as a routine practice in hospitals, the list of obscure fevers, undiagnosed diseases, puzzling anaemias, mysterious enlargements of organs, such as Egyptian splenomegaly, will remain as long as ever, and will be a stumbling-block to medical men who write about them, label them with local names, or call them after their own or somebody else's name. "Simple fevers," "continued" or otherwise, are, in my opinion, frequently due to intestinal parasites—to intestinal sepsis in other words.

The bearing of these remarks on the treatment of bilharziosis by the intravenous injection of antimony tartrate is that symptoms such as tachycardia arising in the course of treatment by the drug may be due not to antimony tartrate at all, or at most only secondary to it; they may be due to a totally different cause—to other parasites for instance—although at the same time bilharzia may be present. The faeces should always be examined in hospital cases for parasites whilst antimony treatment is on its trial, and in private practice also if circumstances render it desirable. It should be borne in mind that in Egypt the intestine is infested with parasites, and it is best to get rid of these before commencing the treatment of bilharzia by antimony tartrate.

Mr. Newlove, pathological assistant at the Khartoum Civil Hospital, has often found in the faeces of Egyptians literally hundreds of *Taenia nana*, the small tapeworm which is so common an inhabitant of the Egyptian intestine. Thymol is no good, nor eucalyptus, but *Filix mas*, given on an empty intestine, will nearly always settle it. It may be that in order to cure an Egyptian of all his parasites, a series of courses of treatment is necessary—emetine for *Amoeba histolytica*; thymol for ankylostomes; *Filix mas* for *Taenia nana* and other tapeworms; then antimony tartrate for bilharziosis; and, at intervals, laxatives (white mixture), enemas, intestinal antiseptics such as bismuth for the micro-organisms, and lavage for lamblia (flagellate) and rectal parasites.

The faeces should be examined and the usual methods used to rid him of his parasites other than bilharzia, but there should be no abuse of the antimony treatment until those sources of trouble have been investigated in cases of bilharziosis.

Incidentally I may emphasize the necessity of the routine examination of the faeces in hospitals in tropical

*Circumspect = cautious and attentive.