The question of surgical treatment is put before the patient, together with the statement that, so far as my personal experience goes, these more severe cases of war headache do not undergo spontaneous cure, and that the operation, besides being devoid of any serious risk to life, is almost certain to bring about alleviation or cure within twenty-four to forty-eight hours.

Warning is also given as to the "new" pains which may develop as the immediate result of the operation, and as to their gradual disappearance subsequently.

Results of Operation.

Within twenty-four to forty-eight hours or so of the operation it is customary to find that the "old" headache, however many months or even years it may have existed, has completely disappeared or else that it is of so mild a description as to be almost negligible. The immediate effect of the operation is most marked. During the next three weeks or so, in the convalescing stage, mild recurrences of the "old" headache have been observed, of short duration and readily controlled by aspirin, etc. The patient becomes bright and cheerful, full of gratitude for the relief obtained. It is quite common, however, for the patient to complain within a day or two of the operation of a "new" pain, sometimes quite severe, neuralgic in type, in the temporal region, with some stiffness in the masticatory muscles, and a "thumping" pain in the immediate vicinity of the decompression opening. These new pains are obviously associated with the operation directly, dependent on the division of the temporal muscle, interference with the nerves of the region, and the trephine opening itself. Any sudden exertion may bring on the "thumpings." It is quite unusual, however, for these "new" pains to persist for more than a few days. In the few cases in which the "new" pains have proved unusually severe there has been some trouble at the operation from bleeding, or else the patient has suffered from vomiting after the operation. In these cases, also, palpation over the decompression opening has shown a degree of tenseness which should not be present in the ordinary straightforward case. This tenseness is either due to an effusion of blood or is dependent on the free escape of cerebro-spinal fluid and a too slow absorption thereof. Within three weeks both "old" and "new" pains should have disappeared, the patient being bright and cheerful, hopeful of the future.

On following up these patients, in their after-history it has been found that, taking all in all, the late results are equally encouraging, as can be seen from the summary given below. Any real relapse is very rare, though now and again complaints are made of mild recurrences, both of the "old" and "new" pains. All patients have expressed themselves in terms of gratitude for the relief or cure obtained.

The following is a brief summary of twenty cases of subtemporal decompression carried out for the relief of headache, chronic and severe, the result of gunshot wound or other injury of the head, the headache leading to total incapacitation and rendering the sufferer utterly miserable. In the majority of cases the patient has himself requested operative measures, all other remedies having failed.

ABSTRACT OF CASE HISTORIES.

1. Gunshot wound, left temporal, August, 1916. Constant headache. Decompression two years after injury.
2. Gunshot wound, frontal, July, 1917. Constant headache. Decompression eight months after injury.
3. Gunshot wound, orbito-frontal, and "buried," October, 1917. Headaches ever since. Decompression five months after injury.
4. Gunshot wound, frontal, November, 1917. Headaches severe and persistent. Decompression three months after injury.
5. Gunshot wound, occipital, April, 1918. Headaches constant. Decompression four months after injury.
6. Gunshot wound, frontal, and hernia cerebri, June, 1918. Headaches severe. Decompression four months after injury.
7. Gunshot wound, temporo-occipital, numerous small foreign bodies in brain, November, 1917. Persistent headache. Decompression five months after injury.
8. Gunshot wound, frontal, and "blown up," November, 1917. Persistent headaches. Decompression ten months after injury.
9. Head injury in 1910, followed by headache and fits. Much worse after service in India. Decompression twelve months after going to India. Invalided home.
10. Gunshot wound, frontal, April, 1915. Headache and fits ever since. Decompression three and a quarter years after injury.
11. Gunshot wound, mastoid, in Palestine, May, 1917. Headaches incessant. Decompression seven months after injury.
12. Injury to head in 1910. Headache and fits ever since; worse after service in India. Invalided home. Decompression fourteen months after proceeding to India.
13. Injury to head in 1915. Occasional headaches at first; after service in the East, headaches continuous. Invalided home. Decompression after one to two years' service.

14. Gunshot wound, fronto-parietal, April, 1918. Never free from headaches. Decompression three weeks after injury.
15. Fractured base, August, 1917. Headaches persistent. Decompression ten months after injury.
16. Gunshot wound, orbito-frontal, August, 1917. Persistent headaches. Decompression, right and left, six and sixteen months after injury.
17. Gunshot wound, frontal, May, 1918. Headaches very severe. Decompression five months after injury.
18. Gunshot wound, parieto-occipital, July, 1918, foreign body in cortex. Headaches severe. Decompression four months after injury.
19. "Blown up," concussion, August, 1918. Headaches persistent. Decompression two months after injury.
20. Gunshot wound, frontal, October, 1918. Headaches very severe. Decompression two weeks after injury.

INFLUENZA AMONG POISON GAS WORKERS.

BY

FRANK SHUFFLEBOTHAM, M.D.

(A Report to the Medical Research Committee.)

THE general impression which has been created that workpeople employed in the various processes connected with the production of poison gases enjoy a large degree of immunity from influenza has led me to make an investigation at the various factories, filling stations, and stores where poison gases are manufactured or handled, with a view to ascertaining the prevalence of influenza and the severity of the symptoms among this class of worker, and I am much indebted to the medical officers of these factories for valuable information which they have placed at my disposal.

I will deal first with a factory situated in a large Midland town where influenza was very prevalent during the two last epidemics. At this factory workers were engaged in processes in which sulphuretted hydrogen, chloro-picrin and chlorine were involved. On the sulphuretted hydrogen and chloro-picrin plants twenty-seven workpeople were employed; during both epidemics only one man was reported as suffering from influenza, and this case was very mild. With this exception, the health record among these workers was extremely good. On the chlorine plant 142 girls were employed, working on three shifts, and out of this number only six cases of influenza arose, and all of a mild form.

The medical officer of this factory has been good enough to give me details with regard to the incidence and severity of influenza among his own private practice in the same town. Out of a panel of 1,143 insured persons, no fewer than 802 contracted influenza, of whom 42 suffered from pneumonia as a complication, and of these pneumonia cases 6 were fatal. Three of these cases were men over 60 years old, two were men aged 31 and 24 respectively, and the remaining one suffered from tuberculosis of the lung. Apart from the panel practice, the same medical officer was called in to see 177 private cases of influenza. Pneumonia supervened in 14 of these cases, and there were 4 deaths, 3 in children; the fourth case was a man aged 74. With regard to the complications of this epidemic, pneumonia was not only the most frequent but the most serious. The other complications were: rheumatism, otorrhoea, severe neuralgia, pleurisy, colitis, gastritis in various forms, and one case of melancholia.

From these figures it is abundantly clear that poison gas workers were practically immune from influenza in this district, as only 4 per cent. of this class of worker contracted influenza of a very mild type, while 68 per cent. of the medical officer's panel patients were attacked, and the various complications indicate that the epidemic among these persons was of a serious character.

The second example I shall give will be taken from the workpeople employed in a factory in Staffordshire where similar poison gases were dealt with. In this case about 200 men and women were employed, and during the two epidemics there were only two cases of influenza. One of these contracted the disease on the way from Scotland; the second was fatal owing to the man insisting on returning to work before recovery. The medical officer of this factory reports that in his private practice in the same district, out of a panel of 2,500 he had 620 patients suffering from influenza, of whom 18 contracted pneumonia, with 5 deaths. In addition, he attended at home 150 private patients, of whom 13 had pneumonia as a sequel; one of these cases was fatal. The complications of the epidemic in this district were pneumonia, pleurisy,

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 Thérapeutique, 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

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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