lower third of the ureters respectively. Further, secondary bacterial infection may complicate the picture at any time. For these reasons it cannot be too strongly emphasized that, in Europeans at least, bilharzial infestation should be diagnosed as early as possible and thoroughly treated. It is equally important to remember that cystoscopy, the complement-fixation test, and the intradermal skin test for schistosomiasis, may reveal infestation at a time when ova are not demonstrable in the urine or faeces.

Since 1900 this patient had passed through the hands of a number of practitioners; it is particularly unfortunate that his condition remained undiagnosed until carcinoma had supervened, for at an earlier date the intravenous administration of tartar emetic would have been curative.

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SOME FACTORS IN THE REDUCTION OF ABSENTEEISM DUE TO CATARRHAL CONDITIONS

BY

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The impairment of efficiency and earning capacity of the worker which is caused by mild ailments, especially catarrhal illnesses, is of such magnitude that no apology is needed for this brief report on some measures that have resulted in approximately a 50 per cent. reduction of absenteeism in the head offices of a large industrial undertaking.

In estimating the significance of the accompanying comparative table it should be remembered that the figures relating to the approved society do not include any absences from work of less than three days, while those relating to the industrial undertaking include absences of one day only.

There are several factors which contribute to the striking differences—for example, the healthy position of the building and its design, a system by which a good mid-day meal is available for the employees at a reasonable cost, and the encouragement of exercise by the provision of a well-equipped gymnasium and facilities for outdoor games. Also of great importance is the medical supervision of every member of the staff. The essence of this supervision is that every employee has easy access to the resident medical officer at certain hours of the day. Appointments are fixed beforehand by the matron, so that time spent in the doctor's waiting room is reduced to a minimum. All new employees are medically examined before they are engaged; so, too, are all employees who have been away from work on account of ill-health. Thus many minor defects are discovered, and advice given for their remedy before they have assumed such proportions as will lead to illness and its consequent wastefulness both to the patient and to the employer. Other important factors in the reduction of sickness have been: (1) ultra-violet ray medication; (2) remedial exercises prescribed by the medical officer, and taught by the gymnasium instructor after office hours; and (3) inoculation, both prophylactic and curative.

The high figure in Column B is accounted for by the fact that any employee reporting sick, with a slight rise of temperature, increased pulse rate, or other early symptoms of illness, is immediately sent home to bed and told to call in a private practitioner. A day or two in bed is more economical than the lengthy absence which may result from neglecting illness in its initial stages.

It is disturbing to note the very high absenteeism due to catarrhal conditions. The total percentage of employees

Sick Absence in the Offices of an Industrial Undertaking for the Year ended December 31st, 1930, compared with Figures supplied by a Similar Undertaking, and by an Approved Society consisting largely of Office Workers.

	Average Number Employed A	Percentage of Sick Absentees B	Average Amount of Sick Absence in Days per Person Employed C
Head office staff of the industrial undertaking	1,444	75.2	4.70
Staff of a similar large London office	2,256	68.5	9.15
Members of an approved society	2,404	No figure available	9.16

absent some time during the year suffering from all forms of sickness was 75.2, while the corresponding figure from catarrhal conditions was 51.625. Attempts to control the absenteeism due to this cause have met with some degree of success.

PROPHYLACTIC INOCULATION

This was offered to every member of the staff, and was an experiment in mass autogenous vaccine. During the preceding winter, cultures were taken from the throats and noses of a large number of workers suffering from sore throats and coryza. This was done under the supervision of Dr. M. R. Brady, and cultures were made in his laboratories. The cultures were taken on to warmed fresh blood agar slopes, and the tubes were carefully kept warm until they were actually placed in the incubator. By this method a greater variety of organisms was found in the cultures than in controls which were allowed to cool, or which were taken on other culture media.

In the manufacture of the mass autogenous vaccine, scrupulous attention was paid to the smallest bacteriological details and technique. If a luxuriant growth of the micro-organisms was not obtained on a twelve-hour culture, fresh cultures were taken so as to avoid repeated subculturing, which would have tended to attenuate the organisms, and therefore to lessen the potency of the vaccine. In sterilizing the vaccine the minimum amount of heat was used, all suspensions being killed in thirty minutes at 60° C. The total amount of antiseptic in the vaccine was 0.5 per cent. phenol in 0.9 per cent. sodium chloride: thus the possibility of extensively damaging the structure of the micro-organisms was reduced to a minimum. It was essential to give accurate doses in so potent a vaccine, so the strength of every micro-organism contained in the vaccine was estimated by counting on a Thoma-Zeiss haemocytometer.

It is interesting to note that the influenza bacillus was found in a large number of cases where these precautions were observed, but was not found in cultures taken from the same patients in tubes which had been allowed to cool between the taking of the culture and the placing of the tube in the incubator. The organisms found were:

Staphylococcus (mixed), *Streptococcus haemolyticus*, streptococcus, *Micrococcus flavus*, pneumococcus, *Micrococcus tetragenus*, Friedländer's bacillus, *Bacillus influenzae*.

and from these the vaccine was made up. The first dose consisted of 50 millions of the mixed staphylococcus and 5 millions of each of the other organisms in 1 c.cm. The second dose was four times the first, and the third dose was ten times the first. It has to be admitted that the increase in dosage was somewhat steep, but this was

done in order to enable a large final dose to be given and at the same time to avoid the inconvenience which would have been caused to the patients had it been decided to work up to the maximum dose by an increased number of injections. Very few of those inoculated developed a general reaction; in such cases intermediate doses were administered with only a 50 per cent. increase over the previous dose. A very small percentage required the full number of five doses. In the few cases in which a reaction occurred, there was already existing some degree of mild, acute, or chronic catarrh. By paying careful attention to the importance of already existing catarrh, it should be possible to avoid general reactions.

Persons subject to "colds" and influenza are to a large extent the "carriers" of the coryza epidemics. The micro-organisms which they pass on have often an increased virulence. They are the most susceptible to infection, and have the lowest resistance. In our efforts to reduce epidemics, these cases must be immunized against their own micro-organisms, and, for a few years, should be prophylactically immunized against the prevailing coryzal infection.

The result of this inoculation on absenteeism for catarrhal conditions was as follows. The percentage of inoculated persons who lost time owing to catarrhal affections was 35.294; while the corresponding percentage of uninoculated persons was 51.625. There is little doubt that the beneficial effect of inoculation would be much more obvious were it not for the efficacy of the treatment applied to the uninoculated who subsequently became infected.

TREATMENT OF CATARRHAL CONDITIONS

Patients reporting sick were divided roughly into two classes:

1. Those in whom severe symptoms had developed. These cases were subdivided into: (a) those where the onset of symptoms occurred less than thirty-six hours before the patient reported sick; (b) those where the onset of symptoms occurred more than thirty-six hours before the patient reported sick, and where he had neglected to seek medical advice in the early stages of the infection.

2. Those presenting only mild symptoms.

The cases classified as severe were those with a temperature of over 100°, pulse over 120, headache and severe coryza, or physical signs of involvement of the lungs or bronchi. The mild cases were given simple symptomatic treatment—for example, quinine, aspirin, expectorants, etc.

The treatment for cases classified as severe was determined by the duration of the symptoms. Patients who gave a history of thirty-six hours or less were given 1 c.cm. of S.U.P. 36 intramuscularly. Injections were made at first into the upper border of the trapezius muscle, but later into the deltoid, as injections at this site produced less discomfort.

Cases which were of more than thirty-six hours' duration were given 2 c.cm. hypodermically of a polyvalent antibody. The preparation which gave the most satisfactory results is that sold under the name of "antibacsyn." This injection was repeated daily in a number of patients who were able to continue at work, but who still presented some symptoms.

It is to be noted that the patients treated with S.U.P. and antibacsyn were such as, in the ordinary course of events, might be expected to be disabled from one to three or more weeks. In a few instances in which the patient "did not believe in injections," the refusal of treatment was followed by absence from work of from two to six weeks, and many of these cases were certified as acute bronchitis, lobular and lobar pneumonia.

The absenteeism among the severe cases so treated was 3.958 days, while the absenteeism among the mild cases amounted to 3.536 days. In other words, the severe

cases so treated lost less than half a day more than the very mild cases which were given simple symptomatic treatment. One may conclude, therefore, that in S.U.P. 36 for early cases, and in antibacsyn for later cases, two valuable agents are available for combating the enormous loss of efficiency which catarrhal conditions impose on the community.

CONCLUSIONS

Prophylactic inoculation showed a definite reduction in the incidence and severity of catarrhal illnesses. This reduction is to some degree obscured by the successful use of S.U.P. 36 and antibacsyn in the treatment of the uninoculated—S.U.P. administered within thirty-six hours of the onset of the symptoms and antibacsyn administered after this period—which very substantially reduced the absenteeism from acute catarrhal conditions.

I must express my thanks to Dr. Brady for his invaluable advice and for his assistance in the preparation of the vaccines.

THE PHARMACOLOGY OF PERCAINE

BY

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While considerable clinical experience of percaine has been reported in this country, in the *British Medical Journal* and elsewhere, both as a local anaesthetic (Lake and Marshall,¹ Walker,² Popper³) and for spinal anaesthesia (Howard Jones⁴), no report of the pharmacology of this drug has, to our knowledge, appeared from a British laboratory. In view of the discrepant findings of Continental workers (Uhlmann,⁵ Lipschitz and Laubender⁶), and of the increasing use of local and regional anaesthesia in surgery, a further investigation of percaine, and a comparison of it with the more established members of the group, seemed desirable.

Percaine is a quinoline derivation—the hydrochloride of the diethylethylenediamide of α -butyloxycinchonic acid.

It is manufactured at Basle, and the first publication of its properties was made in June, 1929, by Uhlmann.⁵ It is available in crystalline form, and is colourless, odourless, and easily soluble in water or normal saline, but is readily precipitated by alkali. The makers' claims—that it can be heat-sterilized without loss of strength, and that it can be combined with adrenaline—have been confirmed. Sterile solutions are stable, retaining full activity for several months at least. We have had some evidence that solutions which have not been kept under aseptic conditions lose their activity in a relatively short time.

The following experimental investigations have been carried out, in the hope that the value of the new drug might be fairly assessed.

Intradermal Wheal Test on the Human Subject

Solutions of various strengths in 0.9 per cent. NaCl were injected intradermally, always using 0.5 c.cm. for a test. The sensation of pain was tested by the application to the skin of a pin-point suitably mounted. Tests were directed to determine (a) the minimal concentration required for anaesthesia as compared with novocain, and (b) the duration of the anaesthesia afforded by any given