

cult." We are quite in accord with the suggestion that it would probably be found possible to reduce the number of small auxiliary hospitals, so saving medical personnel, and to use country houses and the like only as convalescent homes.

"The problem cannot be solved by an overworked and understaffed department, manned almost entirely by officers trained in peace time in the routine of a small regular army. Much of the good work already accomplished is due to the unceasing efforts of temporary officers who have striven against the dead weight of official methods." Our contemporary concludes by once again urging the Director-General to take a wide and impartial view of the situation, and for the sake of his department, and the achievements at the front, so to modify conditions at home as to combine the highest efficiency with the economy the application of which cannot be much longer delayed."

### TREATMENT OF MALARIA BY INTRAVENOUS INJECTIONS OF QUININE URETHANE.

The following interesting article by Mr. W. B. Griffin, F.R.C.S.Eng., appears in the *St. Bartholomew's Hospital Journal* for June:

In a base hospital for cases from Salonica one had a great opportunity of seeing malaria in its most severe form and comparing the various methods of treatment. The men arrived in a very exhausted condition from anaemia, fever, and the gastric complications of malaria, and the loss of weight in many of the patients was very marked.

All the men had quinine treatment by the mouth up to 15 or 20 gr. daily, and many had had intramuscular injections. This treatment had failed to overcome the fever in a large majority of cases, rigors with the temperature reaching 107° and 108° F. occurring daily.

The utter weariness and loss of strength was the symptom complained of by most, the rigors being heroically endured. In several cases the symptoms of coma developed soon after reaching the hospital, the so-called "cerebral" cases. Difficulty in swallowing was quickly followed by loss of speech, loss of power in the limbs, unconsciousness, and incontinence of urine and faeces. This state would be reached in twenty-four hours from the onset.

The pupils were dilated and reacted slug-

gishly to light, pulse quick and feeble, and respiration was often Cheyne Stokes in character. The spleen was large and tender, kneejerks diminished, and there was no ankle clonus or Babinski's sign.

We first tried intravenous injections of quinine urethane for this type of case, and the results were really astonishing. The mixture used was as follows:—

Chlorhydrate of quinine	...	0.40 c.c.
Urethane	... ..	0.20 c.c.
Distilled water	... ..	1 c.c.

To this solution, in an antitoxin syringe mounted with a fine needle, was added 14 c.c. of warmed physiological serum, and the whole was slowly injected into the median basilic vein. In the coma cases complete recovery occurred in all cases, in periods varying from twelve to twenty-four hours. It was a fine sight to see men who had been unconscious twenty-four hours ago demanding their breakfast. The temperature fell at once, and in thirty-six hours it was possible to see evidence of disintegration of the gametes and schizostes in the blood from a film examined microscopically. Sometimes one or two injections were given at intervals of twelve hours, and repeated again in a week.

We soon began to treat all cases of malaria with persistent fever with intravenous injections of quinine, and I never saw one bad symptom in over a hundred cases. Intramuscular injection gave rise to pain, which sometimes lasted for weeks, and many cases arrived with large inflammatory masses in the buttocks, which broke down later into abscesses.

The night round in the wards was a different matter after we started intravenous treatment. Instead of high fevers and rigors on every chart, the temperatures were normal. The men stated that the result they noticed most was the loss of fatigue, which followed the injection, and that they felt so much better. From past experience they dreaded intramuscular injections, but intravenous ones were painless.

French doctors told me that thrombosis of the veins was a common sequela at Salonica, but I only saw one transient case in our series. We hardly ever gave more than 6 to 8 gr. of quinine at one injection, and experience proved it to be sufficient. French doctors stated that they gave up to 18 gr. at Salonica.

Parasites in the blood rapidly disappeared, and patients put on weight and lost their anaemia in a short time. After seeing these cases one felt that for severe and persistent fever in malaria intravenous treatment was the most valuable remedy to be obtained.

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