

and it has been estimated in evidence before the Royal Commission on Venereal Disease that for Great Britain 10% of the population of the large towns are suffering from syphilis.

In conclusion I would suggest that—

(1) The simpler flocculation tests, such as may conveniently be carried out in the laboratories of mental hospitals, are quite capable of yielding results of considerable assistance in correct diagnosis.

(2) The flocculation method employed be one in which a series of dilutions (three or more) of inactivated serum are set up for incubation with an emulsion from a simple heart-cholesterin extract.

The Malarial Treatment of General Paralysis⁽¹⁾. By JOHN DUNNE, M.B., Assistant Medical Officer, Grangegorman Mental Hospital, Dublin.

At the Spring Meeting of the Irish Division, 1925, Norman Graham, of Purdysburn Villa Colony, Belfast, read a very interesting paper on the malarial treatment of general paralysis. Dr. Graham dealt very fully with its history and the various theories which are put forward to account for its remarkable curative properties. Since then I have carried out the treatment at Grangegorman Mental Hospital, and I propose, therefore, merely to give a short *résumé* of the methods used and results.

In all about 35 cases have been, or are, in course of treatment. I am only concerned here with the first 25, as the remainder have only been recently inoculated. The majority of these 25 cases had been a long time in the institution, and were in an advanced condition of paralysis. In each case the diagnosis was confirmed by the usual serological tests.

Dr. Graham kindly supplied the defibrinated blood containing benign tertian parasites. I injected from 2 to 4 c.c. subcutaneously at the angle of the scapula, following Dr. Gerstman's plan of inoculating each layer of tissue as it was pierced by the needle, in order to give the plasmodium a better chance of getting into the circulation. The average incubation period was from seven to fourteen days, varying with the quantity of blood injected. I found that the incubation period was much shorter when 4 c.c. were given than when 2 c.c. were given. In only two cases did no reaction occur, though some required to be injected more than once. One case was injected four times before developing malaria.

⁽¹⁾ A paper read at the meeting of the Irish Division held at Dublin, April 22, 1926.

The course of fever in each case was of the true benign certain type, with considerable variations in the severity of the symptoms. In some the temperature reached 106° F., while in others the maximum was about 103° F.

The malaria subsided spontaneously after six rigors in about three-fourths of the patients. These were treated with quinine, and after they had recovered from their anæmia, were inoculated with fresh parasite. The majority again developed malaria of a mild type, which tended to spontaneous recovery after three or four rigors. A few, however, ran a long course, which had to be stopped with quinine. From this I infer that one attack produces a mild degree of immunity, which gradually passes off with time.

An attempt was made to revive the parasite in 7 cases where the malaria had subsided, by intravenous injection of 10 c.c. of a 10% solution of sodium nucleinate. The malaria was not revived in any case, but a very severe reaction resulted in two, with a single rise in temperature to 106° F.

I allowed the remainder to attain to about fourteen rigors and then administered quinine 10 gr. thrice daily, following which the fever subsided almost immediately, the parasites disappearing from the blood a few days later.

The immediate general result of the onset of the fever on all patients was a marked anæmia. In four instances jaundice was a complication, and pneumonia in two. Any improvement that took place began as a gradual process after the administration of quinine.

In grouping the results I have found it most convenient to adhere to the following: Greatly improved, slightly improved, no improvement and deaths. Of the 25 cases, 8 are greatly improved, 7 are slightly improved, 5 show no improvement, 5 have died.

Of the 8 greatly improved, 2, who were of the expansive, excited type, had advanced tabes. They can now get about well, and with the exception of a little feeble-mindedness, show complete psychical recovery. Two have been discharged and have regained their employment; 4 are among the best workers in the house. Two of these latter had marked dysarthria, which has not improved very much; 1 developed typical epileptic fits, which ceased on the administration of bromides.

The 7 slightly improved show marked physical with little corresponding psychical improvement, but all are much more amenable and do light work. Each of these ran a very mild course of malaria, spontaneous recovery occurring in every instance. The 5 who showed no improvement were hopelessly demented and paralysed, and are still so.

Five died, 1 from pneumonia, 2 from epileptiform seizures, and 2 as a direct result of their demented condition. An autopsy was done in 3 cases. The blood and all the organs contained the parasite in large numbers. The brain substance was very congested, but the microscopic appearance presented no change from that usually found in advanced general paralysis. Spirochætes were observed in only one case.

The most noticeable features in connection with the treatment are :

(a) The recovery of control of sphincters in all cases except 2 out of 20 who had incontinence.

(b) The marked physical improvements. Only 3 cases out of the 25 remain in a weak condition.

(c) The ease with which the malaria can be controlled with quinine.

(d) In no case was there recovery of the light reflex or of knee-jerks, or of speech where these were lost.

(e) The greatest improvement followed in those cases where the temperature was very high, and where the course of malaria extended for more than ten rigors.

Conclusion.

Eight out of 25, or 32%, greatly improved is a result which corroborates the findings of others who have been engaged in this work.

The death-rate of 5 out of 25, or 20%, exaggerates the danger of the treatment, as in only 1 out of the 5 was death directly caused by malaria.

The malarial treatment undoubtedly arrests the progress of the disease, and if given in the early stages, before there is extensive destruction of the brain-cells, offers a reasonable hope for cure.

My thanks are due to Dr. W. D. O'Kelly, of University College, for making the serological examination of the cerebro-spinal fluids, to Dr. Norman Graham for his advice, and to Dr. O'Conor Donelan, Medical Superintendent of Grangegormán Mental Hospital, for his permission to publish these results.

[At the same meeting at which this paper was read, a synopsis of the results of malarial treatment of general paralysis by Dr. Norman Graham, of the Purdysburn Villa Colony, Belfast, was presented, which together with those obtained by Dr. Dunne, recorded in the foregoing paper, show that the interest taken in Ireland in this treatment is not behind that of other countries.—EDS.]

PURDYSBURN VILLA COLONY, BELFAST.

Results of the Malarial Treatment of General Paralysis.

Number treated in 1924-25	70
„ discharged	27 (38·6%)
„ died	16 (22·8%)
„ remaining in hospital (including <i>two</i> re- admissions)	28 (37·2%)
„ failed to develop malaria owing to previous infection	1 (1·4%)

The following figures for the years 1914-15 and 1924-25 show, as compared with the number of admissions, an increase of 47% of discharges as against 0% in the first of these periods, and also a diminution of over 50% in the number of deaths.

Year.	Admissions.	Discharges.	Deaths.
1914	19	0	21
1915	18	0	23
Total	37	0	44
1924	27	11	13
1925	24	13	13
Total	51	24	26

The Whittingham (W.) Strain of Artificially Induced Malaria: Observations made during the Treatment of General Paralysis and Tabes Dorsalis.⁽¹⁾ By A. R. GRANT, M.D.Aberd., Deputy Medical Superintendent, and J. D. SILVERSTON, M.B., B.S. Durh., Senior Assistant Medical Officer, The County Mental Hospital, Whittingham, Preston.

THE treatment of general paralysis of the insane by malaria has been carried out in this hospital since July 21, 1922, and several observations on the value of this form of therapy in the disease have been made by us (4, 5, 6) from time to time. In this short note we wish to draw attention to some of the characteristics and behaviour of a strain of malaria which has now reached the fourth year of its existence, and which still retains all its former potency and therapeutic value.

⁽¹⁾ Reprinted by kind permission of the Editor with some amendment from the *Journal of Tropical Medicine and Hygiene*, April 15, 1926.