Conclusions.

In cases of general paralysis, cholesterol was found in the cerebro-spinal fluids in measurable quantities in 30 cases. A trace of cholesterol was present in 6 cases, and no cholesterol could be detected in 2 cases.

No measurable amounts of cholesterol were found in fluids from cases of dementia simplex, dementia præcox or epilepsy with insanity. Traces occasionally found may be due to contamination with blood, as, though every precaution was taken, a very few red corpuscles would have sufficed to give these exceedingly faint reactions.

The cholesterol of the cerebro-spinal fluid of general paralytics appears to be combined with the albumen present in the fluid, only very faint traces existing in the albumen-free filtrate.

In conclusion we desire to express our thanks to Dr. Golla, Director of the Pathological Laboratory, and to Mr. S. A. Mann, Assistant in the Laboratory, for their advice and assistance in this research.

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Acquired Immunity to Malarial Inoculation [1]. By J. Ernest Nicole, L.M.S.S.A.Lond., Senior Assistant Medical Officer, Lancashire County Mental Hospital, Winwick, and John P. Steel, M.B., Ch.B.Edin., Assistant Medical Officer to the Hospital.

In connection with the malarial treatment of general paralysis of the insane in this hospital, we have endeavoured to produce a second series of malarial rigors in such cases as had not shown sufficient mental or physical benefit after a first infection terminated six or more months ago.

From the figures published from time to time by the originators of the treatment, we were led to believe that the inducement of a second series of malarial rigors was a matter of mere routine procedure. We were, however, surprised to find that such was far

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from being the case. Fourteen patients who were subjected to reinoculation, some even three times, showed no clinical signs of malaria.

To remove any possible doubt as to the technique of the inoculations, we would say that we are aware that if only gametocytic forms of parasite were introduced, no pyrexia could result. Proof that asexual forms were injected is to be found in the footnote to the accompanying table, for in every case except one we can point to other patients who were inoculated from the same syringeful of the blood of the donor, and who, later, developed true malaria, these patients being infected for the first time.

Having been confronted with such a definite immunity we had, perforce, to search for some factor peculiar to these immune cases which might be correlated with this resistance to subsequent infection, especially as we have found only one case to be resistant to a *first* infection.

In so far as naturally occurring malaria is terminated as speedily as possible by the exhibition of quinine, and whereas, in contrast, therapeutic malaria is allowed to continue to the limit of tolerance, we thought perhaps the number of rigors in the primary attack was responsible for the subsequent immunity, and that relapses might also be a factor.

Our figures show that such is not the case. Reference to our table will also prove that the inoculation methods of neither the primary infections nor the subsequent attempted infections had any bearing on the matter.

It should be added that all the primary pyrexias have been terminated in the usual way by means of quinine, which was administered until the blood was definitely negative to microscopic examination.

Further, our reinoculations have been performed at widely varying intervals of from six to twenty months.

In view of the theory advanced in support of the I.K. treatment of tuberculosis, *viz.*, " that the more important protective substances of an immunized blood exist chiefly, though potentially, in the erythrocytes," we, for a time, thought that the relationship between the blood-groups to which the various donors belonged and those of the recipients might prove a fruitful field for research. It seemed possible that the hæmolysis consequent upon the mixing of different bloods might thereby liberate certain antibodies capable of having been produced by the first malarial attack.

The inoculation would necessarily account for an extreme dilution of such liberated antibodies, as is laid stress upon by those who support the I.K. theory.

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Case.	Blood group.	Age.	First inoculation.	Blood from Case.	Blood from Group.	Route.	Number of rigors.	Relapses.	Subsequent change in C.S.F.	Subsequent inoculation.	Blood from Case.	Blood from Group.	Route.	Same blood successful in cases number—
3	—	41	10/1/24	15	—	I.V.	7	Yes	—	29/4/25	STM	—	I.M.	94
8	2	38	3/12/23 11/4/24	40	1	Mos. I.V.	11	No	No	27/7/25	97	4	I.V.	100, 101, 102
17	4	36	11/2/24	Mosquito		—	5	Yes	Yes	27/7/25	97	4	I.V.	100, 101, 102
18	2	36	3/10/23	Mosquito		—	4	Yes	Yes	30/5/25	96	—	I.V.	—
										17/7/25	RS	—	I.M.	97, 98, 99
29	4	40	23/11/23	Mosquito		—	10	No	Yes	31/7/25	97	4	I.M.	100, 101, 102
										31/8/25	102	4	I.M.	28, 77
30	—	59	3/10/23	STM	—	I.V.	—	—	—	—	—	—	—	—
40	1	32	31/3/24	Mosquito		—	9	Yes	Yes	17/7/25	RS	—	I.M.	97, 98, 99
43	4	36	27/7/24	20	20	I.V.	9	Yes	Yes	11/2/25	88	4	I.M.	53
										30/5/25	96	4	I.V.	—
										27/7/25	97	4	I.V.	100, 101, 102
										5/8/25	97	4	I.M.	*ibid.*
51*	2	31	—	—	—	—	—	—	—	7/1/24	Mosquito		—	53
										30/4/25	78	4	I.M.	22, 79
										17/7/25	RS	—	I.V.	97, 98, 99
53	4	30	9/9/24	43	4	I.V.	10	Yes	Yes	9/2/25	88	4	I.V.	—
										3/5/25	78	4	I.V.	22, 79
										17/7/25	RS	—	I.M.	97, 98, 99
54	1	35	28/5/24	75	4	I.V.	7	Yes	Yes	5/8/25	97	4	I.M.	100, 101, 102
										31/8/25	102	4	I.M.	28, 77
62	4	48	29/4/24	8	2	I.V.	10	No	Yes	5/8/25	97	4	I.M.	100, 101, 102
										31/8/25	102	4	I.M.	28, 77
63	4	43	29/4/24	8	2	I.V.	3	Yes	Yes	31/7/25	97	4	I.V.	100, 101, 102
71	4	38	6/5/24	62	4	I.V.	6	No	Yes	24/5/25	94	3	I.M.	—
										17/7/25	RS	—	I.V.	—
79	2	32	24/8/24	78	4	I.M.	2	No	Yes	11/2/25	88	4	I.M.	58

* This case was infected successfully before admission by mosquito. I.M.=Intramuscular injection. I.V.=Intravenous injection.

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Although having no practical experience of I.K. therapy and no real knowledge thereof, it seemed worth while to investigate and classify the blood-groups of the cases under review. We were again disappointed to find that no conclusion as to the significance of blood-grouping, in this connection, could be drawn, especially as all our donors except one happened to belong to Group 4.

Owing to the difficulty hitherto experienced in obtaining infected mosquitoes, we can, at present, point to but one case (No. 51) where a subsequent infection has been attempted by all three routes, inclusive of mosquito bite. Col. S. P. James, of the Ministry of Health, has recently arranged to assist us in this matter, so we hope it will be possible at a later date to report further on this point.

Whether the serum of an " immune " patient will abort or prevent the development of a rigor we are not in a position to say, nor have we the opportunity to ascertain, as the results obtained from the malarial treatment of general paralysis of the insane appear to be so beneficial, in our experience, as to prevent our terminating the pyrexia before we are compelled to by the condition of the patient.

In this connection it may be of interest to mention that where the necessary tests have been performed on the "immune" patients, we have found that only two have failed to show some change in the cerebro-spinal fluid (*cf.* also *Lancet*, October 31).

Our chief reason for publishing our findings is that the further research into such an acquired immunity, especially if carried out under more propitious conditions than those prevailing in a mental hospital, may yield results important to preventive medicine, and that it may be of use to others to know even such negative findings as it has been our lot to obtain.

Our best thanks are due to the medical superintendent, Dr. F. M. Rodgers, for permission to make use of our work for publication, to Prof. Mackie, of Edinburgh University, and to Dr. J. G. Thomson, of the London School of Tropical Medicine, for much encouragement and kindly advice.

The Incubation Period of Benign Tertian Malaria [1]. By G. DE M. RUDOLF, M.R.C.S., L.R.C.P., D.P.H., D.P.M., Assistant Medical Officer, Claybury Mental Hospital.

THE incubation period of naturally acquired benign tertian malaria is usually given as being from two to three weeks. Thus James (1920) states that the period is usually from 14 to 18 days, Stitt (1922) from 14 days, Acton, cited by Castellani and Chalmers

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