31st. July 1950.

Dear Rob,

I have been playing about a little more with the evaluation of blood group systems, taking the three parallel problems, of a) false identity, b) interchange of the newly born (presumably at a nursing home) and c) false paternity. E.g. for the MNS system one has

	probability of failure to discriminate	Negative logarithm
M (a)	20.0234 %	1.60783
N (b)	64.2944	.44170
S (c)	72.5905	.32034

the negative logarithms being essentially measures of the value of the group for the purpose concerned, as they are additive when two or three independent groups are used together.

If antisera were available the probabilities are reduced and their negative logarithms increased to the values below

	probability of failure to discriminate	Negative logarithm
M (a)	16.3548	1.81066
N (b)	54.3501	.60973
S (c)	66.8560	.40263

If one were giving evidence as an expert witness there is a further point, namely that the actual genotype may be known for one or both parents from collateral evidence, though presumably only the phenotype is available for the child, e.g. in cases of suspected interchange there may be other undisputed children of the marriage capable of establishing for example that a S parent is really Ss, or in an MNSs parent which way round the genes are associated. It might therefore be worth while also considering what the frequency of failure to discriminate would be when both parents are known genotypically and the infant only phenotypically.

As these calculations can be confusing I wonder if it would be worth while submitting a short note to the Hematology Congress, presumably to be read in title only or published in the Proceedings, for I shall not be able to be in Cambridge at the time. Let me know if you think such a thing would be a) useful and b) likely to be acceptable on these terms.

I might have time to compare other groups if you have a spare proof of the relevant portions of your book where I can pick out acceptable frequencies so far as these have been ascertained.

Ask Ruth what she thinks.

Yours sincerely,