

January 26, 1940

Dear Taylor,

I have recently counted a further lot of about 3,000 from Slough, so that you may like to adjust Janet Vaughan's previous figures, which I gave you on the typed sheet, to the following totals

| | Women | Men | Total. |
|----|-------|------|------------|
| O | 3056 | 3419 | 6475 |
| A | 2963 | 3292 | 6255 |
| B. | 540 | 649 | 1189 |
| AB | 177 | 223 | <u>400</u> |
| | | | 14319 |

I mentioned that I meant to try the effects of adjusting these data on the basis of the proportions found wrongly grouped. The following table gives the proportions per 1000 retested of each type found to be wrongly grouped ~~in~~ for each of the three alternative types:

Misgroupings per mille

Transferred to

| | | O | A | B | AB |
|---------------------|----|------|-------|-------|-------|
| Transferred from | O | - | 19.65 | 12.72 | 2.31 |
| | A | 4.69 | - | 7.04 | 16.43 |
| | B | 8.40 | 8.40 | - | 25.21 |
| | AB | 9.17 | 0 | 0 | - |

From these we can calculate the corresponding transferences required on the total Slough frequencies given above:

| | | Total Frequencies Transferences | | | | | |
|---------------------|----|---------------------------------|-------|------|-------|------------|----------|
| | | O | A | B | AB | Total gain | Net gain |
| Transferred from | O | - | 127.2 | 82.4 | 15.0 | 224.6 | -181.6 |
| | A | 29.3 | - | 44.0 | 102.8 | 176.1 | -38.9 |
| | B | 10.0 | 10.0 | - | 30.0 | 50.0 | +76.4 |
| | AB | 3.7 | 0 | 0 | - | 3.7 | +144.1 |

One point to notice is that the misgroupings have not erred on the safe side from the point of view of transfusion, as one might possibly have expected if workers were concerned to test large numbers as rapidly as possible, with a view to finding a number of reliable O donors. The errors have been predominantly in the opposite direction, or in favour of false negative readings. In consequence the estimated proportions, both of the A and the B genes will be increased, and it is of

interest next to see whether this increase is enough to account for the increase in the numbers of AB's, that is to say, to see how the adjustment has affected the apparent deficiency of AB's, when these are compared with expectation based on the numbers of A's and B's. What one finds is as follows:

| | Original frequency | Adjustment | Adjusted frequency |
|---------|---------------------------|------------|--------------------|
| O | 6475 | -181.6 | 6293.4 |
| A | 6255 | - 38.9 | 6216.1 |
| B | 1189 | + 76.4 | 1265.4 |
| AE | 458.015 400 | +144.1 | 544.1 |
| Exp. AB | 458.015 | - | 494.904 |
| Diff. | - 58.015 | - | + 49.196 |

It appears that the frequencies of misclassification, judged from Janet Vaughan's tests are amply sufficient to account for the original deficiency in AB persons. This entirely justifies your view that this deficiency could be entirely accounted for by technical errors. The change produced is, in fact, nearly double as great as would be required on this view, and this is a puzzling circumstance, unless Janet Vaughan has managed to retest a higher proportion of doubtful cases, and a lower proportion of correct groupings than existed in her material as a whole. Of course the actual numbers of those found wrongly grouped are small, and to this extent uncertain. Yet the largest numbers in the table of actual transferences are based on retests of O's and A's, which must be accepted as the most accurate, being based on 865 and

426 retests respectively. Consequently I think we should have been very unlucky if the adjustments to total frequency were far enough wrong to be very misleading. However, the only real test is to see if other material behaves in the same way. Do you think you will be able to get anything sufficient from Oliver?

I will enter up the Wakefield data, and understand you would like the 31 doubtful cases classified as Sutherland suggests, essentially on the cells, ignoring the anomalous serum reactions. Unfortunately his detailed table of these does not distinguish which are the 19 males and which the 12 females. Provisionally I have divided them proportionately.

Yours sincerely,