September 29, 1941

Dear Whately Carington,

I have now received your letter of proposals and queries, and have been interested as much as I usually am in the rather refined logical analysis which your type of experiment seems to require and deserve.

First, to dispose of two points briefly: I have no objection whatever to my name being associated with the system of scoring by means of the logarithms of the probabilities such as you have in mind. Indeed it seems to me more appropriate to associate a personal name with a case such as this, on the border-line as it were between between personal judgment and rigorous demonstration, than, as is customarily done, with supposedly rigorous mathematical theorems, for in the case of these latter it may be said that, if they are objectively demonstrable, any normal mind considering the point ought to have satisfied itself of their truth, and, in fact, many previous mathematicians can usually be cited who, without enunciating the theorem, evidently had perceived its truth. Here the personal contribution seems to lie more in the method of proof, or route, adopted in framing a satisfactory demonstration.

Next, the general scoring method and its standard error developed on p.2 seem to be correct and exactly as I should have done it myself. I do not recall having communicated it to Saltmarsh and Soal,

though I have given it in lectures in the Department. Possibly it reached them through Stevens.

In respect of the probabilities used as the basis for scoring, these must, I think, be based on using previous material exactly as you propose to use the material to be tested, e.g., if the same percipient has taken part in more than one experiment, he is, for this purpose I suppose counted as a different percipient on each occasion, so that, if n percipients take part in the experiment, the total number of different percipients in the record will be $S(n)$ where the summation is taken over all experiments, or, as I think quite properly, over all in which the object to be scored, e.g., pig, is not exhibited. Then, if in any experiment a different percipients return a drawing recognisable as pig, the probability will be properly estimated as

$$p = \frac{S(a)}{S(n)} \cdot$$

If now in an experiment in which pig is exhibited, of m percipients b return pig, the score stands at $(pm - b)\log n$ for this item, with corresponding contribution to the variance.

I do not think the circumstance that different percipients give themselves different probabilities of making a successful return really affects the issue, at least if the percipients of the experiment can properly be regarded as a random sample of those available for the previous experiment on which the estimate p was based. It would do so, I imagine, if a selection were made of particularly prolific percipients for a particular test. The alternative procedure of basing p on the number of scorable items available in previous experience, and then scoring the items rather than the percipients in the critical test does obviate this particular difficulty, but at the

expense, I should imagine, of much greater complication connected with a possible unwillingness of a percipient, or indeed possible proneness to keep on drawing the same object. Consequently I should prefer scoring percipients, as I think you would yourself.

Yours sincerely,