4th May, 1956.

My dear Frank,

I have been looking through your long letter on the treatment
of the various transformations.

(i) On the question of the number of decimal places to be
retained in the log log and logit transformations, I favour four
as you ~~for~~ have the material already calculated, though I think there
is very little in it.

(ii) For notation I see in my <u>Biometrics</u> paper I used $\underline{x}$ as
the symbol in general, distinguishing the special cases of the
angular transformation and the logit by using ϕ and $\underline{z}$. Many
people are happier using $\underline{x}$ for the abscissa of the normal curve,
but of course consistency with all such associations cannot
possibly be achieved. Differences in symbolism for different
cases undoubtedly help many readers to know what is being dis-
cussed; I do not know that anyone has used a specific symbol for
the log log. For the legit I would certainly continue to use $\underline{X}$.

I see y used y specifically for the working Veriate 132,3 but only temporarily.

(iii) You say that it has frequently been represented to us
that the present Table XII is somewhat inadequate. About the
time of my <u>Biometrics</u> paper, I sent a fuller table entered from 0° to 90° for

the final corrections, with maximum and minimum values, all with
three decimal places, which is indeed superfluous, but does give
a reassurance to the reader who likes to see how differences are
going, though he may in fact use methods of interpolation mechan-
ically. Giving the whole range of 90° instead of only 45° seems
to me really important in avoiding the confusion which many have
encountered
~~felt~~ with half of the table not given explicitly.

(iv) I greatly doubt the advantage of range when both maximum
and minimum values are given in any of the final adjustment
tables. The first inclination was to develop the algebra in
terms of maximum and range, but maximum and minimum are really
                              being used systematically
easier to work in computation, and with them both given the range
is really superfluous, and distracts attention from what is
immediately serviceable.

(v) Certainly Table XIII is superfluous and only a curiosity.
If we threw it out, however, we should probably find that
innumerable biological assay people, using small numbers of rats
or mice, habitually scored their experiments by means of it. The
                          such as
proper fractions 3/7 or 1/8 are very widely familiar and con-
venient, and one may doubt even if they are destined to be
replaced by the corresponding decimal fractions.

(vi) If you scrap Table VII, which in various ways is very
widely used, we shall need to tabulate the hyperbolic tangent and

its inverse, I suppose, both ways, with keys for the recognition
of equivalences. People can get confused with such things as
$p = \frac{1}{2}\frac{1-r}{2}$, and I fancy the hyperbolic tangent relationship with
its inverse $r + \frac{1}{3}r^3 + \frac{1}{5}r^5 + \cdots$ can keep people on the rails, I mean
people about as much concerned professionally as is an ordinary
mathematical schoolmaster. Of course, what we do at present is
a historical hangover like much else, but the historical effects
are now in the minds of thousands of people, and we have not a
clean slate to write on. Therefore, in respect to stuff which
has been much used, the principle must be to expand (and we can
afford to expand quite handsomely) when there is any good purpose,
rather than to present something new and unrecognizable. You
might care to look through again the general exposition in the
Biometrics paper, which is somewhat more extensive than the
introductions in past editions, and treats things like the square
root transformation more competently than the slightly half-baked
work of Cochran, to which we refer. If, a general symbol were
to be used for the transforming variate, I think x is inevitable,
and I should be inclined to use it generally, varying it for
special transformations, a convention which, I fancy, went suc-
cessfully in the Biometrics paper. I should like our new intro-
ductory material, which will surely have to be rewritten, to
conform generally with this paper, though it would best be

actually rewritten in your department so as to distribute emphasis according to your own feelings. Thanks for sending the new paragraph on to Barnard. Looking forward to seeing you Wednesday week.

Sincerely yours,