Dear Hope-Jones,

It really is good to hear from you again after so long. A Quaker too! Well, I share your admiration for the community, but I probably am not of the stuff of which converts (to any thing) are made.

First, may I adjust your bivariate formula, for yours does not give unit S.D. for the two variates as you thought.

Taking off
and integrating with respect to y from - to - one gets

then, integrating, you have

(unit S.D. for x)

and again, with respect to x.

If you inserted a factor \((y - x)\) before the first
integration, the result is clearly zero, so the mean value of \( y \) for given \( x \) is \( x \), as in your case.

Then the mean value of \( xy \) for given \( x \) is \( x^2 \), and so for all values must be, if \( x^2 = 1 \), as has now been arranged.

The coefficients of the quadratic in \( x \) and \( y \) which constitute the index are therefore

written as a matrix, which as I want you now to realise, is the inverse of

forces of the total correlation: this is really the tip you wanted, for of course any S.D.'s mean can be absorbed, into the denominator of the lower matrix, making it of variances and covariances (mean squares and products), and into the denominator of the upper matrix, where they clearly belong.
For thinking of heredity, and of nearly all concrete problems, you need regressions rather than correlation. By diverting Galton from the direct measure of the efficiency of selection, the regression of son on father, to the abstract correlation coefficient, Pearson put the subject back for a full generation. In my book on Statistical Methods (I am now preparing the 3rd edition), I deal at great length with regression before correlation is mentioned at all, and this heretical approach has been found immensely helpful. Take the simultaneous regression of the child on the two parents in your data

\[
\begin{align*}
  b_1 s(x_1^2) + b_2 s(x_1 x_2) &= s(x_1 y) \\
  b_1 s(x_1 x_2) + b_2 s(x_2^2) &= s(x_2 y)
\end{align*}
\]

\[
\begin{align*}
  b_1 + b_2 / 16 &= .51 \\
  b_1 / 16 + b_2 &= .51 & (b_1 = b_2 = \frac{.51}{.51} = .463)
\end{align*}
\]

This is the figure you might expect to reproduce in a population
with different mating habits.

(Only, Pearson is said to have mixed up different classes, i.e. U.C. students and an East End survey, hence his high marital correlation (.25 I think); he removed the original data from the Galton Laboratory, when I was appointed, so I could not salvage the facts.)

Why don't you come down and stop a week-end sometimes? I am living in College, and so would have the pleasure of entertaining you.

Yours sincerely,
Dear Hope Jones,

It really is good to hear from you again after so long. A wonder too!

Well, I think you should look for the opportunity, but I firmly am not of the stuff of which farmers (or anything) are made.

Firstly, I must adjust your manifold formula, for you have not put $2/3$ for $3/2$ as you should.

Take

$$y = C + \frac{1}{2} \ln \left( \frac{x + y + 1}{x + y - 1} \right)$$

and integrate, which yields $y = A \pm \sqrt{B}$, you get

$$\frac{1}{2} \ln \left( \frac{x + y + 1}{x + y - 1} \right) = \frac{1}{2} \ln \left( \frac{y}{A} \right) + \frac{1}{2} \ln \left( \frac{B}{y} \right)$$

from which you have

$$C \int \frac{1}{2} \ln \left( \frac{x + y + 1}{x + y - 1} \right) = \frac{1}{2} \ln \left( \frac{y}{A} \right) + \frac{1}{2} \ln \left( \frac{B}{y} \right)$$

as you will subtract $x$.

$$C = \frac{1}{2} \ln \left( \frac{B}{y} \right)$$

If you substitute $x = -y$, before the first integration, the result is always $y = 0$. The second integration yields $y = 0$ for $y = 0$

Thus the series only for $y > 0$ and $y < 0$.

So for all values must be $y$, if $\frac{1}{2} = 1$, as the rows have merged.

The coefficients of the partial $x$ are $y$ which can be $2/3$ or $1/3$.

$$\frac{1}{2} \left[ \frac{1}{x + y + 1} - \frac{1}{x + y - 1} \right]$$

$$\frac{1}{2} \left[ \frac{1}{x + y + 1} - \frac{1}{x + y - 1} \right]$$

not a question, which do you want to substitute in the series?

$$\left\{ \begin{array}{c}
\frac{1}{x + y + 1} \\
\frac{1}{x + y - 1}
\end{array} \right\}$$

Some of the above solutions, that is really the only way you can find for of some way $3/2$ is now to substitute, at the moment if the lower limit, which it of $x = y$ and $y = y$, at $x = 0$ and $y = 0$.

The determinant of the upper corner, when the then leading.
For the sake of brevity, we will be limited...