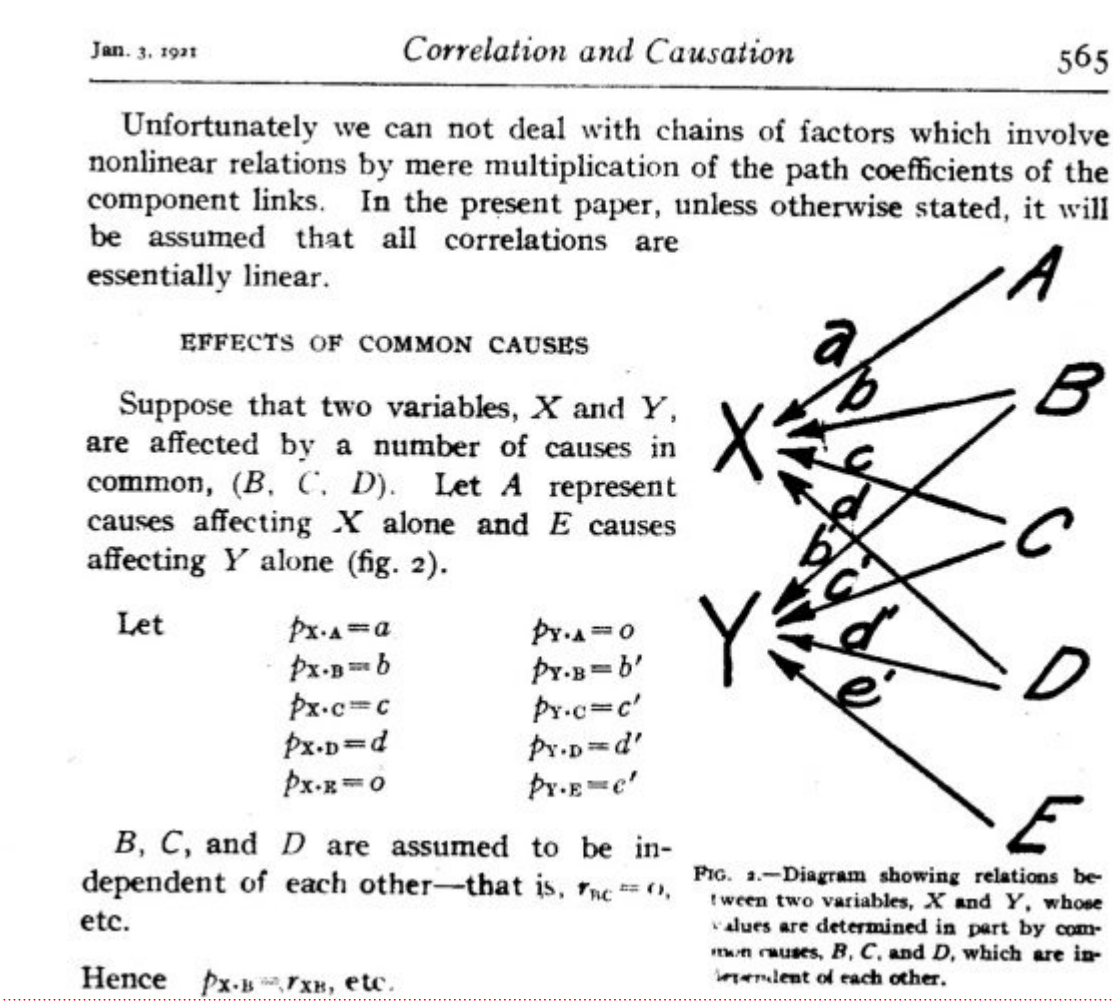
PHILOSOPHY, SOFTWARE

CORRELATION NOT CAUSATION

28.09.2017

I am following up some references Rudi Balling showed in his talk yesterday. Sure, correlation is not causation,



Jan. 3, 1921 *Correlation and Causation* 565

Unfortunately we can not deal with chains of factors which involve nonlinear relations by mere multiplication of the path coefficients of the component links. In the present paper, unless otherwise stated, it will be assumed that all correlations are essentially linear.

EFFECTS OF COMMON CAUSES

Suppose that two variables, X and Y, are affected by a number of causes in common, (B, C, D). Let A represent causes affecting X alone and E causes affecting Y alone (fig. 2).

Let

$p_{X \cdot A} = a$	$p_{Y \cdot A} = o$
$p_{X \cdot B} = b$	$p_{Y \cdot B} = b'$
$p_{X \cdot C} = c$	$p_{Y \cdot C} = c'$
$p_{X \cdot D} = d$	$p_{Y \cdot D} = d'$
$p_{X \cdot E} = o$	$p_{Y \cdot E} = e'$

B, C, and D are assumed to be independent of each other—that is, $r_{BC} = 0$, etc.

Hence $p_{X \cdot B} = r_{XB}$, etc.

FIG. 2.—Diagram showing relations between two variables, X and Y, whose values are determined in part by common causes, B, C, and D, which are independent of each other.

An excerpt of the famous Wright paper 1921

but I fear that with all that systems biology we already ended in the scientific nirwana than generating any useful hypothesis.