

especially useful in pointing out the nature of the error involved in the frequent definition of the partial correlation coefficient as that between two variables "when the other variables are held constant." It can not too strongly be emphasized that *no* variable is held *constant* in the partial correlation measurement. This process of measurement seeks merely to eliminate from the indicated correlation between two variables the part which arises from their mutual linear dependence upon certain other specified variables. The development in the book is especially happy in that it shows the only way in which constant or "assigned" values enter the concept of partial correlation.*

The remaining chapters, on *Random sampling fluctuations*, *The Lexis theory*, and *The development of the Gram-Charlier series*, are of somewhat less general interest than the earlier portions of the book. They are, however, important to the general reader; and the exposition of the probable error (standard error, rather than probable, is considered in the text) derivations and their significance is especially worthwhile.

The reviewer has not sought to verify in detail the symbolic portions of the text; but, if there be any mistakes, they are not such as to impede careful reading and full understanding of the discussion.

A difficult task has been handled by the author with admirable skill; and statisticians generally will be grateful for a volume which is available for courses and reference, for mathematicians and "other workers."

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PRINCIPIA: VOLUMES II AND III

Principia Mathematica. By Alfred North Whitehead and Bertrand Russell. Volumes II and III. Second Edition. Cambridge, University Press, 1927. xxxi+742 pp., and viii+491 pp.

The second and third volumes of the second edition of Whitehead and Russell's *Principia Mathematica* do not differ from the corresponding volumes of the first edition. An account of the changes which the authors think desirable is contained in the introduction and appendices to the first volume of the second edition, of which a review has previously appeared,† but the text of all three volumes has been left unchanged.

The second and third volumes of the *Principia Mathematica* are devoted to building up, on the basis of the system of logic developed in the first volume, the theories of cardinal numbers, relations and relation-numbers, series, well-ordered series and ordinal numbers, and finally of the continuum and of real numbers. The task of developing these theories on the basis of the theorems and processes of logic only, as well as that, undertaken in the first volume, of investigating logic itself by mathematical methods,

* In this connection, the reviewer regrets the parenthetical use (p. 101) of the words "held constant," although he is sure that no careful reader will be misled by them after going through the preceding discussion in the text.

† B. A. Bernstein, this Bulletin, vol. 32 (1926), pp. 711-713.