REMARKS ON REGRESSION

By

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1. In a paper published twelve years ago[1] I derived a set of formulae for bivariate regression which were found to give good results on unimodal materials of a fairly general nature and which, in the case of moderately skew distributions, were reduced to very simple and easily applicable forms. Two years later I extended the theory also to the case of multiple correlations of similar types[2]. These formulae were deduced on the assumption that the correlation surface could be expressed by a so-called series of type A[3], i. e. that the deviations from the best fitting normal surface could be expressed as a series, developed according to the derivatives of different orders of the Bravais function, expressing that normal surface.

When, after the lapse of so many years, I find that this theory has not received the attention which it seems to me it merits in view of the very simple, and on a fairly large class of curved regressions readily applicable results, I attribute this in part at least to the apparent (not actual) speciality of the assumptions made with regard to the mathematical expression for the correlation surface, and in part also to the rather repellent show of mathematics involved in the deductions. In the hope to give the theory a better chance of coming to the attention of statisticians, I propose here to deduce some of my main results in an entirely different way, bringing the theory back on more simple principles. I believe that by this method of deduction it will be more easy for the reader to see exactly where assumptions come in, and also the nature of the restrictions caused by these assumptions.

2. Let x and y be a pair of correlated variates, our material

1. The correlation function of Type A, and the regression of its characteristics. Kungl. Svenska Vetenskapsakademiens Handlinger Bd. 58, Nr. 3. 1917. Also "Meddelanden fran Lunds Astronomiska Observatorium" Ser. II, Nr. 17.
2. Multiple correlation and non-linear regression. Arkiv. for Matematik, Fysik och Astronomi. Bd. 14 Nr. 10, 1919. Also "Meddelanden fran Lunds Astronomiska Observatorium." Ser. I, Nr. 91.
3. Charlier. Contributions to the mathematical theory of statistics. 6. The correlation function of type A. Arkiv for Matematik, Fysik och Astronomi. Bd. 9, Nr. 26, 1914. Also "Meddelanden fran Lunds Astronomiska Observatorium" Ser. I, Nr. 58.