Fig. 12, element 4 quantities are all those submitted for a particular product, customer and year.

The element is a statement in two dimensional form. Taking the example in Fig. 7, the element fits into the linear Backus–Naur description as shown in **Fig. 15.**

Notes

(1) Special Symbols:
under ⟨FUNCTION⟩ S = Sum
F = Frequency
under ⟨RELATIONAL OPERATOR⟩ Ex = Except
under ⟨VALUE⟩ — = Not applicable

(2) The equals sign is assumed in the tabular form.

(3) Where more than one TERM or SERIES is present under primary or secondary conditions OR logic applies to a horizontal list and AND logic to a vertical list, e.g.

Customer No., Year	For each

means for each change in Customer No. OR in Year and

Sex	Male ....
Length of Service	<5 years ....

means where Sex is Male AND where Length of Service is <5 years. The order in which the TERMS or SERIES are written is arbitrary and of no consequence.

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Book Review

Prediction Analysis, by JOHN R. WOLBERG, 1967; 291 pages. (London: *D. van Nostrand Co. Ltd.*, 86s.)

In case others are as puzzled as I was by the title of this book, let me explain what Prediction Analysis is about. A variable y is related to other variables $x_1, x_2, \ldots x_m$ by an equation $y = f(x_1, x_2, \ldots x_m; \alpha_1, \alpha_2, \ldots \alpha_p)$ where the function f is known but the parameters α_i are not. Observations subject to errors of known variance are made on y and on the associated xs. Using the method of least squares it is possible to obtain estimates α_i of the parameters, together with their standard errors. Prediction analysis is concerned with how many and what type of observations should be made in order to achieve prescribed precision in determining the parameters. The author claims that most experiments are of this form and that prediction analysis is the basis of the planning of experiments.

The book has a short chapter on the statistical background, a longer chapter on least squares and a similar chapter on the general theory of prediction analysis. The remainder of the book consists of five chapters dealing with special cases of f (polynomial, exponential, sine, gaussian) with a single x ($m = 1$) and one case with three independent variables.

The statistical material is badly presented with inadequate definitions, a series of incorrect statements about an unbiased estimate of a standard deviation and complete confusion between 'independent' and 'uncorrelated'. The least squares material appears to miss the reason for weighting the squares inversely proportional to the variances. The derivation of the general least squares solution (§3.6) is incomprehensible to me, as is the subsequent result for the standard errors. It is hard to see whether the final result is correct since the resulting computational procedure is iterative and it may well be that the author's method, although different from the usual Newton–Raphson approach, still converges to the least squares values. This appears to need more discussion, using modern numerical analysis, than the author provides. To satisfy myself that the author's method is not wildly wrong I did succeed in obtaining his results by a different method. Anyone who similarly finds himself in difficulties is welcome to write for my notes—which may well be equally obscure, though not, I think, to a statistician. There is considerable discussion of the computational problems, including flow diagrams.

The method of prediction analysis is important and it is a pity that a better description of it has not been provided. It is puzzling to see no mention of preposterior analysis, which has exactly the same ends.

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