The two solutions for unequal n's illustrated in this section each require that the number of observations with n each block be equal.

THE PROBLEM OF ONE MISSING SCORE

The preceding solutions are appropriate when an entire block is missing. The following procedure is applicable when only one score a block is missing. It is analogous to the method in Section 5.6 for estimating missing values in a randomized block design. A missing score is estimated by

$$ABS_{ijm} = \frac{n(\Sigma S_m) + q(\Sigma AB_{ij}) - \Sigma A_i}{(n-1)(q-1)},$$

where = number of blocks in level A_i.

= number of levels of B.

Σ = sum of remaining scores in block containing missing score.

ΣA = sum of remaining scores in treatment combination AB_{ij} containing missing score.

Σ = sum of remaining scores in treatment A_i containing missing score.

For example, assume that score ABS_{122} in Table 8.2-1 is missing. This score is estimated by

$$ABS_{122} = \frac{4(22) + 4(11) - 86}{(4-1)(4-1)} = 5.1,$$

where $\Sigma S_2 = 27 - 5 = 22$.

$\Sigma B_{12} = 16 - 5 =$.

$\Sigma A_1 = 91 - 5 =$).

The estimated score is reasonably close to the original score in that all, which is 5.

After inserting the estimate of the missing score into the data matrix, the analysis of variance is carried out in the normal way. The degrees of freedom for $MS_{B \times \text{subj w. groups}}$ should be reduced by one; for example, $df = p(n-1)(q-1) - 1$. An unbiased estimate of $MS_{B \times \text{subj w.groups}}$ is obtained by this procedure, but all other mean squares are slightly overestimated. According to Anderson (1946), the biases are small. He gives methods for obtaining unbiased estimates, but it is doubtful if the added labor is justified. If another missing score occurs in the same A_i treatment, the iterative procedure described in Chapter 5 may be used. If the second missing score occurs in a different level of treatment A, the procedure of estimating the score described above is repeated. A more complete discussion of procedures for estimating missing scores may be found in Anderson (1946) and Khargonkar (1948).