SHORT COMMUNICATIONS

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On crystallography in higher dimensions. I. General definitions. *Corrigendum.*

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Abstract

It is pointed out that the definition of crystal system as given in Neubüser, Wondratschek & Bülow [*Acta Cryst.* (1971), A**27**, 517–520] is not dimension-independent. Nevertheless it leads to no ambiguity for dimensions 1, 2, 3, and 4, which are the only ones in which it has been used in subsequent papers. An emendation will be given in Neubüser, Plesken & Wondratschek [*match* (*Informal Commun. Math. Chem.*) (1980), to be published].

On p. 519 of the paper to be corrected (Neubüser, Wondratschek & Bülow, 1971) the following definition of a crystal system was proposed:

> 2.9. *Definition:* Each holohedral crystal class **H** determines a *crystal system.* We say that a (geometric) crystal class **C** belongs to the crystal system of **H** if each group of **C** is a subgroup of some group of **H**, but not a subgroup of a group of another holohedral geometric class of smaller order.

This definition implicitly claims the following property of geometric crystal classes: For each geometric crystal class **C** there exists a well defined holohedral crystal class **H** such that each group (of integral matrices) in **C** is a subgroup of some group (of integral matrices) in **H** but is not a subgroup of a finite group of integral matrices from any holohedral geometric class of smaller order.

This statement is in fact true for dimensions 1, 2, 3, and 4 and hence definition 2.9, quoted above, unambiguously distributes the geometric crystal classes and hence also the arithmetic crystal classes, space-group types and space groups into crystal systems for these dimensions. There exist, however, counterexamples to this statement in seven-dimensional space, so that definition 2.9 is not dimension-independent as claimed. The counterexample will be explicitly described in a forthcoming paper by Neubüser, Plesken & Wondratschek (1980).

It is possible, however, to give a dimension-independent definition which yields the same distribution of geometric crystal classes into crystal systems for dimensions 1, 2, 3, and 4 as the one discussed here. This definition can be obtained by a dimension-independent formulation of the statement of *International Tables for X-ray Crystallography* (1952): 'The grouping of point groups according to the kind of lattice with which they can combine to form space groups is analogous to the grouping of three-dimensional point groups into "systems".'. In the above mentioned paper by Neubüser *et al.* (1980) this definition will be given and the various different concepts of crystal system presently in use will be compared.

It should be noted that the error, pointed out above, has also entered the definition of crystal system given in Brown, Bülow, Neubüser, Wondratschek & Zassenhaus (1978). Fortunately, however, it does not affect any of the tabulations given in this book as these deal only with dimensions up to 4.

The authors became aware of the error discussed here through a careful analysis of their paper by Dr Charles Leedham-Green, to whom they are most grateful for his criticism as well as for clarifying discussions.

References

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