Concluding remarks

The general method described in the first part of this paper has been used in the second part to derive the cells for three quasilattices associated with the icosahedral group. For the case $n=6$ it is shown by Kramer (1986) that these cells play a role not only in the description, but also in the construction of the quasilattices. A similar role is expected for the new cells and quasilattices corresponding to $n=10$ and 15.

In response to the first referee's report, the second paragraph of the *Introduction* has been added to provide a background for some of the concepts used in the paper.

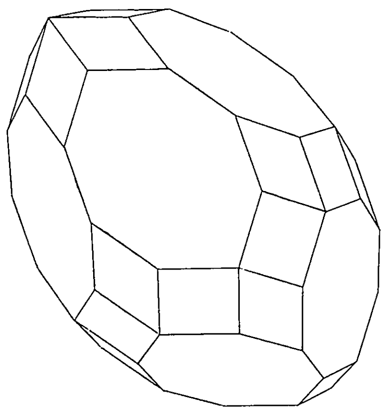

Fig. 21. (5, 10), (1 2 7 10 15) (3 4 5 6 8 9 11 12 13 14)†, $D(5)$.

One of the authors (RWH) would like to thank the Deutscher Akademischer Austauschdienst for the award of a stipendium.

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SHORT COMMUNICATIONS

Contributions intended for publication under this heading should be expressly so marked; they should not exceed about 1000 words; they should be forwarded in the usual way to the appropriate Co-editor; they will be published as speedily as possible.

Acta Cryst. (1987). **A43**, 587-588

Tables for the third-order elastic tensor in crystals.

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(*Received* 9 *February* 1987; *accepted* 17 *March* 1987)

Abstract

It is pointed out that the tables for the third-order elastic tensor in crystals first given by Fumi [*Phys. Rev.* (1951). **83**, 1274-1275; *Phys. Rev.* (1952). **86**, 561] have been inconsistently reported for trigonal and hexagonal groups by Huntington [*Solid State Physics* (1958). Vol. 7, pp. 213-351. New York: Academic Press] and by Mason [*Crystal Physics of Interaction Processes* (1966). New York: Academic Press], and this has caused confusion in the literature. The tables reported by Brugger [*J. Appl. Phys.* (1965). **36**, 759-768] for all crystallographic groups, which are often quoted in the more recent literature, actually coincide with those given by Fumi (1951, 1952) even in the choice of independent components.

The 'history' of the tables for the third-order elastic tensor in crystals has unfortunately been rather involved and this has created considerable confusion in the literature that has not yet been completely clarified. The tables for the

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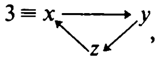
tensor first given by Fumi (1951, 1952) were inconsistently reported for trigonal and hexagonal groups by Huntington (1958; Table II, p. 252) and Mason (1966): specifically, these authors reported for the trigonal groups the tables of Fumi (1951) in the (unconventional) frame with



rather than the tables of Fumi (1952) in the (conventional) frame with $3, \bar{3} \parallel z$, while for the hexagonal groups they reported the tables of Fumi (1952) in the (conventional) frame with $6, \bar{6} \parallel z$. Apparently as a consequence of this inconsistency, Wallace (1970) actually stated that the results of Fumi (1951) for the trigonal groups were incorrect and were corrected in Fumi (1952).

Brugger (1965; Table III)* reported tables identical to those of Fumi (1951, 1952) for all crystallographic groups† even in the choice of independent components, without any reference to Fumi. Since then it has become fairly common to quote in standard references Brugger (1965) for the tables of the third-order elastic tensor in crystals [see *e.g.* Thurnston (1974),‡ Nelson (1979)].

* The redefinition by Brugger (1964) of the higher-order tensorial elastic constants - introducing a factor $(n!)^{-1}$ in the nth-order term of the elastic energy - is irrelevant in this connection.

† The table for isotropy (I) reported by Brugger (1965) but not by Fumi (1951, 1952) follows simply by superposition of the tables for group $m3m$ (CI) and for group 3 (RII) owing to Hermann's (1934) theorem (see *e.g.* Fumi & Ripamonti, 1980; Appendix *B*).

‡ Unfortunately Thurnston (1964) introduces an error in Brugger's (1965) table for group 3 (RII) writing C_{114} instead of C_{115} in the expression of C_{225}.

Hearmon in *Landolt–Börnstein* (1969, 1979) quotes in fact Fumi (1951, 1952) but together with Brugger (1964, 1965) and with Hearmon (1953) - who actually treated a non-tensorial array for third-order elasticity. Sirotin & Shaskolskaya (1982) also quote Fumi (1951, 1952), but unfortunately together with Mason (1966).

It appears that only Markenskoff (1976, 1979) clearly points out the identity of the tables by Brugger (1965) quoted by Thurnston (1974) with those by Fumi (1951, 1952).

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International Union of Crystallography

Acta Cryst. (1987). **A43**, 588

The Ewald Prize

The First Ewald Prize for outstanding contributions to the science of crystallography has been awarded jointly to Professor **J. M. Cowley** and Dr **A. F. Moodie**, for their outstanding achievements in electron diffraction and microscopy, especially for their fundamental contributions to the theory and technique of direct imaging of crystal structures and structure defects by high-resolution electron microscopy.

Their pioneering work on the dynamical scattering of electrons was reported in a series of papers in *Acta Crystallographica* and other journals from 1957 onwards. A theory of Fourier images led them to the multi-slice formulation of the scattering of an electron wave in its passage through a crystal. This formulation is able to take into account many hundreds of scattered beams, and has become the basis of widely used computer programs. The theory allows electron micrographs, obtained with modern high-resolution instruments, to be reliably and quantitatively interpreted, and used for the determination of the structures of both perfect crystals and crystals containing defects.

Professor Cowley and Dr Moodie, together and separately, have made many further contributions to theory, methods and results in electron diffraction and microscopy. Their work has often stressed a unified approach to diffraction and microscopy through physical optics. An overview of the whole field may be found in Professor Cowley's book *Diffraction Physics* [(1981). Amsterdam: North-Holland].

John Maxwell Cowley, born in Australia in 1923 and a graduate of Adelaide University, was formerly a Chief Research Scientist at the Division of Chemical Physics, CSIRO, Melbourne, Australia. Later he was Professor of Physics at the University of Melbourne, and since 1970 has been the Galvin Professor of Physics at Arizona State University, Tempe, USA.

Alexander Forbes Moodie, born in Scotland in 1923, graduated from St Andrews University in 1948. Since then he has been a member of CSIRO in Australia where he is a Chief Research Scientist at the Division of Chemical Physics. This Division was incorporated into the Division of Materials Science and Technology at the end of 1986.

The presentation of the Ewald Prize, which consists of a medal and a certificate for each awardee and a shared award of US $20,000, will take place at the Opening Ceremony of the XIV International Congress of Crystallography at Perth, Western Australia, on 12 August 1987. An honorary medal will be presented to the Ewald family during the ceremony.