dispersion are not statistically significant and the point group cannot be determined in some other manner, then it will be necessary to choose special radiations and reflections for the point-group determination. A very important additional advantage of a complete data set when anomalous dispersion is important has been noted by Ueki, Zalkin, & Templeton (1966): particularly if the space group is polar, then it is possible to obtain a structure that differs from the correct one by many standard deviations if a partial data set is employed.

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Crystal classes of four-dimensional space R4.

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There are 227 crystal classes of four-dimensional space $R4$.

In 1951 one of us, (Hurley, 1951), derived a list of 222 crystallographic point groups of $R4$ using results of Goursat (1889). In the sequel some minor errors in this list have been detected. Therefore we have dealt again with these groups and reenumerated them by three independent methods:

(1) A.C.H. has repeated the calculation leading to the results described in Hurley (1951).

(2) J.N. and H.W. have used results of Hermann (1951). In this paper he dealt with the 'maximal crystallographic point symmetry groups'*. In $R4$ there are four of them. Two of order 1152 and 240 respectively which he called *volltransitiv* are explicitly described in his paper. The other two of orders 288 and 96, belonging to types which he called *imprimitiv* and *intransitiv* respectively, are not explicitly given. Hermann only states the fact that they are easily obtained from crystallographic point groups in lower dimensions. All crystallographic point groups of $R4$ are contained as subgroups in these four groups. The determination of these subgroups and their equivalence relations has been done with computer programs for the investigation of finite groups described in Neubüser (1960) and Felsch & Neubüser (1963).

(3) E. C. Dade (1965) determined the maximal finite groups of integral 4×4 matrices up to transformation by integral unimodular matrices. There are nine of them. It is not difficult to see that under transformation by rational non-singular matrices they fall into seven crystal classes which correspond to Hermann's four groups and to some subgroups of these. We therefore used as in (2) the programs mentioned before to check the previous calculations.

The results of all these methods agree and yield the following corrections of the tables given in Hurley (1951):

(i) In Table 1(*b*) two crystal classes XXXV $\mu=2$, $\nu=2$, $D=1$ and XXXVII $m=\mu=\nu=1$ of order 32 are equivalent.

(ii) The entry for crystal class XLIV of order 96 in Table 1(*b*), p. 655, has to be replaced by

$$1I+9E+\mathbf{6}F+8K+\mathbf{8}N+6R+\mathbf{10}T.$$

* Mathematically formulated this means: he dealt with maximal finite groups of $n\times n$ integral matrices classified up to transformation by rational non-singular matrices.

(iii) The following 6 crystal classes which are subgroups of the corrected group XLIV have to be added:
Table 2(*a*), p. 656,
Order 24 $1I+9E+8K+6R'$;
Table 2(*b*), p. 658,
Order 8 $1I+1E+2F+2R+T+T'$;
24 $1I+3E+6F+8K+6T'$;
24 $1I+3E+6F+8K+6T$;
48 $1I+9E+6F+8K+8N+6R'+3T+7T'$;
48 $1I+9E+6F+8K+8N'+6R'+7T+3T'$.

(iv) There are two misprints in Table 1(*b*), p. 655:
XXXIII $\mu=1$, $\nu=1$, $D=6$, $q=1$, $l=0$ should have 1 E instead of 1F
XLIII should have 48C instead of 48A.

(v) There are some misprints in the values of the Goursat parameters in the first columns of Tables 1(*a*) and 1(*b*). In family XII all values of n should be doubled, and in family XIII′ all values of both m and n should be doubled. In family XXXV the fifth member should have $l=2$ instead of $l=3$, and the final member should have $q=1$, $l=r=0$.

After these corrections the total number of crystal classes of $R4$ turns out to be 227. The complete list with further additions concerning relations to three-dimensional black-white- and grey-groups is being published by A.C.H. in the book:
Quantum Theory of Atoms, Molecules, and the Solid State, a Tribute to John C. Slater. Edited by P. O. Löwdin. New York: Academic Press. (To appear 1966–67.)

Other detailed information obtained in the course of the calculations described under (2) and (3) will be published later.

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