Or les parties trigonométriques $\xi(h_j)$ des facteurs de structure sont de tels objets puisqu'on peut linéariser leurs produits (Bertaut, 1955) sous la forme (1). Les $\xi(h)$ constituent donc la base d'une algèbre commutative. C'est l'algèbre du groupe d'espace correspondant, en d'autres termes, *les relations de linéarisation* (1) écrites avec les $\xi(h)$ pour un groupe donné, *sont* aussi *représentatives du groupe* que le sont par exemple l'énumération des coordonnées de points équivalents ou l'énumération des opérations de symétrie.

Interêt pratique: — La méthode statistique (Bertaut, 1955) de détermination de signes fait intervenir le calcul de valeurs moyennes de produits de facteurs de structure, l'expression la plus générale étant

$$\overline{E^a(h_1)E^b(h_2)\ldots E^k(h_m)} \qquad (a, b, \ldots, k = \text{exposants entiers}). \quad (2)$$

Pour l'évaluer dans un groupe donné, on doit écrire la relation de linéarisation

$$\xi^a(h_1)\xi^b(h_2)\ldots\xi^k(h_m) = \sum_s a_s\xi(H_s) \qquad (3)$$

et y chercher le coefficient de la partie non aléatoire (c'est à dire a_s avec la condition $H_s = 0$).

La linéarisation de produits tels que (3) est également nécessaire dans la méthode d'approche directe (Bertaut, 1955).

Les tables de linéarisation que nous avons rédigées (Bertaut & Dulac, 1955) contiennent l'information suivante:

1°. Groupes centrosymétriques. — On donne

(*a*) les relations de symétrie entre les facteurs de structure (par exemple $\xi(hkl)=\xi(\bar{h}\bar{k}\bar{l})=\xi(\bar{h}k\bar{l})(-1)^{k+1}=\xi(\bar{h}k\bar{l})(-1)^{1+h}=\xi(\bar{h}\bar{k}l)(-1)^{h+k}$ dans le groupe D_{2h}^2–*Pnnn*),

(*b*) la linéarisation des produits de deux facteurs de structure $\xi(h)\xi(h')$,

(*c*) la linéarisation des carrés $\xi(h)^2$,

(*d*) la linéarisation des puissances troisièmes et quatrièmes de $\xi(h)$ quand l'ordre de symétrie ne dépasse pas 8.

2°. Groupes sans centre de symétrie. — On donne les relations de linéarisation des carrés des modules $|\xi(h)|^2$ qui servent à la détermination des facteurs de structure invariants (indépendants du choix de l'origine) et de leurs signes réels (± 1).

3°. Groupes plans. — La même information que sous 1° et 2° est donnée.

Une préface de 18 pages explique les abréviations et notations et l'usage des tables, la détermination des poids statistiques p, des facteurs atomiques 'modifiés', l'application des tables à la détermination des signes des facteurs de structure et à l'évaluation des moyennes (2).

Une table de matières permet de retrouver aisément les tableaux de correspondant à un groupe donné.

Les tables de linéarisation (75 pages) ont été reproduites en 100 exemplaires seulement.* Si les tables s'avéraient utiles pour le cristallographe, une réimpression pourrait être envisagées dans une meilleure présentation.

Références

BERTAUT, E. F. (1955). *Acta Cryst.* **8**, 823.

BERTAUT, E. F. & DULAC, J. (1955). *Tables de Linéarisation des Produits et Puissances des Facteurs de Structure.* Grenoble: Laboratoire d'Électrostatique et de Physique du Métal.

BHAGAVANTAM, S. & VENKATARAYUDU, T. (1951). *Theory of Groups and its Application to Physical Problems.* Waltair: Andhra University.

* Les tables de linéarisation ont été imprimées sur stencil par les soins du Laboratoire d'Électrostatique et de Physique du Métal, Centre National de la Recherche Scientifique, Institut Fourier, Grenoble, France; elles sont cédées au prix coûtant de 400 fr. + frais d'expédition.

Des microfilms peuvent être obtenus par le Centre de Documentation du Centre National de la Recherche Scientifique, 18 Rue Pierre Curie, Paris 5e, France.

Notes and News

Announcements and other items of crystallographic interest will be published under this heading at the discretion of the Editorial Board. Copy should be sent direct to the British Co-editor (R. C. Evans, Crystallographic Laboratory, Cavendish Laboratory, Cambridge, England).

Acta Crystallographica

Prof. E. W. Hughes will not be able to assume his duties as American Co-editor until June 1956. Articles should, therefore, not be submitted to him before that date.

Double reflexion in aluminium–copper alloys

An error occurs in the above article by J. M. Silcock (*Acta Cryst.* (1956), **9**, 86). In Table 1 the phrase in brackets in the heading of the first column should read '(Al lattice indices)'.

X-Ray Microscopy and Microradiography

A Symposium on the above subject, sponsored by the International Union of Pure and Applied Physics, will be held in the Cavendish Laboratory, Cambridge, England, during the period 16–21 August 1956. The Symposium will include all microscopic methods which employ X-rays, and it is intended to be a gathering of those with some direct experience or interest, rather than a large public conference. Primary emphasis will be placed on the physical methods in theory and practice. Sessions are planned on the reflexion method, the contact method

and the projection method, and the leading exponents will introduce each subject. Sessions will also be devoted to applications in biology, medicine, metallurgy and other fields, including industrial applications.

Further information may be obtained from Dr W. C. Nixon, Cavendish Laboratory, Cambridge, England.

A.S.T.M. X-ray Diffraction Data Card File

Section 6 of the *X-ray Diffraction Data Card File*, distributed by the American Society for Testing Materials, has recently been completed and published. It is available in plain and keysort cards and covers approximately 600 new powder patterns and 600 revised and improved data patterns previously issued in Sections 1–5 inclusive. A revised *Cumulative, Alphabetical and Grouped Numerical Index of X-ray Diffraction Data* (STP 48E), including the new Section 6, has also been published.

The alphabetical index comprises 300 pages and is subdivided as follows: inorganic, organic, organic formula, and minerals. The organic formula index is new with this edition and is an aid in finding the data for organic compounds which, in many cases, are known by different names. Entries are grouped according to the number of carbon atoms in the molecule and according to the number of different elements other than carbon in the molecule. The numerical index contains 382 pages of entries classified into Hanawalt groupings of the three most intense lines of the diffraction patterns. Each substance is listed three times in the numerical index with each of its three strongest lines first, to make it possible to find the desired entry even though the unknown pattern may have one or two of its strongest lines omitted.

The *Index* also includes a list of cards in the data file recommended for deletion, cards which have been replaced by preferred data more complete or more accurate than cards previously issued.

Section 6 of the *X-ray Diffraction Data Card File* on plain cards (3 × 5 in.) is priced at $135·00 for the first deck and $50·00 per deck for additional decks. Section 6 on keysort cards (4 × 6 in.) is priced at $185·00 for the first deck and $70·00 per deck for additional decks. A copy of the *Index* is furnished without charge with each order; it may also be purchased separately for $10·00 per copy. Orders or inquiries for additional information should be addressed to the American Society for Testing Materials, X-ray Department, 1916 Race Street, Philadelphia 3, Pa., U.S.A. (In Great Britain the *X-ray Diffraction Data Card File* is distributed by the British Institute of Physics, 47 Belgrave Square, London S.W. 1, England.)

Book Reviews

Works intended for notice in this column should be sent direct to the Editor (P. P. Ewald, Polytechnic Institute of Brooklyn, 99 Livingston Street, Brooklyn 2, N.Y., U.S.A.). As far as practicable books will be reviewed in a country different from that of publication.

Microstructures of diamond surfaces. By S. Tolansky. Pp. viii+67 with 143 figs. London: N. A. G. Press. 1955. Price 40*s*.

This monograph constitutes a livelily presented interim report of the extensive mass of observations, mostly unpublished, on the micro-structure of diamond surfaces, made by Prof. Tolansky and his co-workers in the course of the last years.

Prof. Tolansky has undertaken a really thorough study of the micro-topographical structure of diamond surfaces, both natural and treated in a number of ways. In this short review it is possible only to summarize briefly the various objects of his study: growth figures, cleavage surfaces, corrosion figures, traces of possible plastic flow (slip), percussion marks, polished faces, sawn faces, the quality of diamond tools.

Apart from ordinary microscopy, optical techniques of very high sensivity were mostly used, especially those which have been developed and amplified by Prof. Tolansky himself since 1940, i.e. multiple beam interferometry, the light-profile microscope, and optical shadow casting.

Over 140 plates of a rare quality illustrate how ideally suited these techniques are for the purpose. Prof. Tolansky has been able to reveal and to measure a wealth of interesting (and sometimes unexpected) detail on the so-called 'perfect' surfaces of diamond.

As diamond is a material which interests a broad public, the book is kept within a reasonable length, and is written for the general reader. The chapters dealing with the elements of the optical techniques and with the crystallographic characteristics of diamond are therefore very brief, and even the simplest mathematics are avoided. The physical interpretation of some observed features is not very extensively discussed, a fact which, of course, may be regretted by a number of research workers.

As a conclusion, we recommend this monograph, both to these research workers of different scientific and technological branches who are interested in diamond and to the crystallographers who are interested in the properties of crystal surfaces in general. Interested specialists can find at the end a bibliography with references for a more detailed pursuit of the subject.

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