

inclination method. These two pairs will have the same radius for the reflecting circle, a fact which will be of advantage when direct comparison is made between the two layers, especially in the de Jong & Bouman method of recording.

Buerger (1940) has shown that the Lorentz factor for the general case is given by $1/\cos \mu \cos \nu \sin \gamma$, where the symbols have their usual significance (Buerger, 1942). For the special case of $\mu = +\nu$ which we are considering this reduces to the form $1/\cos^2 \mu \sin \gamma$. Further, we have also $\sin \frac{1}{2}\gamma = \frac{1}{2}\xi/\cos \mu$, so that finally $L^{-1} = \cos^2 \mu \sin \gamma = \cos^2 \mu \sin 2 [\sin^{-1} (\frac{1}{2}\xi/\cos \mu)]$, which could be calculated as a function of ξ and μ . The factor P is obviously equal to $\frac{1}{2}(1 + \cos^2 2\theta)$ and has been tabulated by Buerger & Klein (1945) as a function of σ ; here $\sigma^2 = \xi^2 + \zeta^2$, which, for the zero layer, reduces to $\sigma = \xi$. Hence we get

$$D = L^{-1}P^{-1} = \cos^2 \mu \sin 2 [\sin^{-1} (\frac{1}{2}\xi/\cos \mu)]P^{-1}(\xi),$$

from which the variation of D with ξ and μ could be calculated. The results of the calculation are represented in Fig. 1, which follows in lay-out the presentation adopted by Cochran (1948) for the normal-beam and equi-inclination photographs.

The chart consists of curves of constant D , the values of which are indicated at the bottom. The ordinate gives the value of μ in degrees. The abscissa is the value of the coordinate ξ , where ξ and ζ are the cylindrical coordinates of a reciprocal-lattice point when the reciprocal lattice is drawn to the scale 10 cm. = 1. If the inclination angle μ is known, the value of the correction D for each reflexion hkl may be found as follows:

1. A straight line ruled on a transparent material is laid horizontally across the chart so as to join the two

divisions corresponding to μ on either end of the chart. The points where this straight line intersects the curves of constant D are marked on the transparent scale.

2. A drawing of the zero layer of the reciprocal lattice is now made on a scale 10 cm. = 1. The origin of the D scale is placed over the origin of the reciprocal lattice and the D scale is rotated so that it passes over the lattice points corresponding to the various reflexions. The corresponding value of D is read off by simple interpolation.

The charts have been drawn at intervals of 0.1 for D , the maximum of D being 2.0. It will be noticed that in the charts of Cochran (1948) the maximum is only 1.0 because effectively he has omitted the factor $\frac{1}{2}$ in the expression $\frac{1}{2}(1 + \cos^2 2\theta)$ for P . Over most of the region, D can be read to ± 0.02 so that linear interpolation can give an accuracy of 1% in the correction.

The author desires to thank Prof. R. S. Krishnan for his kind interest and Dr G. N. Ramachandran for his guidance and help.

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International Union of Crystallography

Report of Executive Committee for 1951

Introduction

The most important event of 1951 was the Second General Assembly and International Congress held in Stockholm under the patronage of His Majesty the King of Sweden. A detailed account of this meeting and of the associated symposia has already been published (*Acta Cryst.* (1951), **4**, 567). The year also saw the publication of the first volume of *Structure Reports* to be prepared under the auspices of the Union and the decision to transfer the publication of *Acta Crystallographica* to Messrs Ejnar Munksgaard of Copenhagen.

Three additional countries adhered as from 1 January 1951 and the status of the membership of Japan was raised from Group I to Group IV. Details of the eighteen countries adhering at the end of the year are given in Table 1.

Work of the Commissions

Commission on Acta Crystallographica

Publication of *Acta Crystallographica* has continued throughout 1951 and Vol. 4 was completed with the

appearance of Part 6 in November. An analysis of the first four volumes (Table 2) shows that the rapid growth of the journal continues. This expansion unfortunately proved such a source of embarrassment to the Cambridge University Press that they found themselves unable to countenance any further increase in size. The Commission felt, however, that arrangements must be made for still further expansion if the journal was to maintain its reputation as the world's chief medium for the publication of crystallographic research. After careful consideration, the Executive Committee accordingly decided to accept the recommendation of the Commission to transfer publication to Messrs Ejnar Munksgaard of Copenhagen as from 1 January 1952. It is hoped that this step will make possible any further expansion of the journal which may prove necessary to meet the requirements of crystallographic research, and that it will also lead to the more rapid publication of material submitted to the editors. The Union owes a deep debt of gratitude to the officers of the Cambridge University Press, and particularly to Mr Brooke Crutchley, University Printer, for their invaluable assistance in launching

Table 1. *Adhering Bodies*

Country	Group*	Secretary of National Committee
Australia	I	R. I. GARROD, Defence Research Laboratories, Private Bag No. 4, P.O. Ascot Vale W.2, Victoria
Belgium	III	R. VAN TASSEL, Institut royal des Sciences Naturelles de Belgique, Rue Vautier 31, Brussels
Brazil	I	E. TAVORA, Faculdade Nacional de Filosofia, Av. Pres. Antonio Carlos 40, Rio de Janeiro, D.F.
Canada	IV	W. H. BARNES, Division of Physics, National Research Council, Ottawa
Czechoslovakia	I	The Secretary, Czechoslovak National Research Council, Opletalova 19, Prague 2
Denmark	I	A. TOVBORG JENSEN, Den Kgl. Veterinær- og Landbohøjskoles kemiske Laboratorium, Copenhagen V
France	VII	V. LUZZATI, Laboratoire Central des Services Chimiques de l'État, 12 quai Henri IV, Paris 4
India	I	The Secretary to the Government of India, Department of Scientific Research, North Block, Central Secretariat, New Delhi
Italy	III	G. GIACOMELLO, The University, Rome
Japan	IV	T. ITO, National Committee for Crystallography, Science Council of Japan, Ueno Park, Tokyo
Netherlands	IV	E. H. WIEBENGA, Bloemsingel 10, Groningen
Norway	I	I. OPTEDAL, Mineralogisk Institutt, Blindern, Oslo
South Africa	I	The Officer-in-Charge, Liaison Division, South African Council for Scientific and Industrial Research, P.O. Box 395, Pretoria
Spain	IV	M. ABBAD, Instituto 'Alonso de Santa Cruz', Serrano 119, Madrid
Sweden	I	F. E. WICKMAN, Stockholm 50
Switzerland	I	M. VAUGNAT, Muséum d'Histoire Naturelle, Geneva
United Kingdom	VIII	The Secretary of the British National Committee for Crystallography, The Royal Society, Burlington House, London W.1
United States of America	VIII	E. A. WOOD, Bell Telephone Research Laboratory, Murray Hill, N.J., U.S.A.

* See Statutes 8 and 10 (*Acta Cryst.* (1948), 1, 275).

Table 2. *Analysis of Volumes 1-4 of Acta Crystallographica*

	Vol. 1, 1948	Vol. 2, 1949	Vol. 3, 1950	Vol. 4, 1951
No. of pages	348	425	490	583
No. of articles in English	55	68	65	88
No. of articles in French	4	4	3	8
No. of articles in German	2	8	4	2
Total no. of articles	61	80	72	98
No. of Short Communications in English	13	20	41	58
No. of Short Communications in French	1	—	2	4
No. of Short Communications in German	1	—	2	1
Total no. of Short Communications	15	20	45	63
No. of Book Reviews	9	4	13	15
No. of countries from which authors are drawn	13	11	17	19

the journal and for the very high typographical standards which have been achieved; it is hoped that it will be possible to maintain these same standards under the new conditions of publication.

In order to meet rising costs, the Executive Committee found themselves compelled to propose an increase in annual subscriptions from the equivalent of 50 Danish crowns to 100 Danish crowns as from 1 January 1952. At the same time a scheme has been introduced whereby bona fide crystallographers in the Adhering Countries may obtain the journal for their private use at a reduced subscription of 60 Danish crowns.

Commission on Structure Reports

Structure Reports for 1947-1948, the first volume to appear, was published at the end of June 1951. Volumes for 1949 and for 1945-1946 are in an advanced state of preparation; the former is in press and should be published by the middle of 1952. The section editors are actively engaged on the volume for 1950.

At the Stockholm Assembly the Commission was

enlarged by the addition of members from Canada, Germany, Japan and Sweden, bringing the number of countries represented to eight.

Commission on International Tables for X-ray Crystallography

Publication of Vol. 1 (Theory of Crystallographic Groups) of the *International Tables for X-ray Crystallography* should take place in 1952. Vol. 2 (Mathematical Tables) and Vol. 3 (Physical and Crystallographic Tables) are in course of preparation.

Commission on Crystallographic Apparatus

The Commission has initiated the programme of activities adopted at the Second General Assembly and has decided to establish an information bureau on crystallographic apparatus and methods. A detailed notice on this subject has already appeared (*Acta Cryst.* (1952), 5, 295).

The Commission has decided not to concern itself with computing devices.

Commission on Crystallographic Data

During the year two further collections of crystallographic data became available, namely the revised edition of the *Index* published by the American Society for Testing Materials, and the *Barker Index*. The latter lists morphological and optical data, including refractive indices and densities, which are tabulated for convenient identification. A note covering this *Index* has already appeared (*Acta Cryst.* (1951), 4, 191).

The revised *Index* of X-ray diffraction powder data published by the American Society for Testing Materials for the Joint Committee of the ASTM, the American Crystallographic Society and the [British] Institute of Physics is published in card form with alphabetical and numerical listings in book form. These data have also been published in an edge-notched form of punched cards (Keysort-Cope Chatt) which provides a mechanical means of searching the index. In addition an index on International Business Machine (Hollerith) cards is now available. Further information on these publications may be obtained from the American Society for Testing Materials, Philadelphia, Pa., or from the Secretary of the X-ray Analysis Group of the [British] Institute of Physics, 47 Belgrave Square, London S.W.1.

At the time of the meeting of the Commission held in Stockholm six member countries had appointed National Data Committees to sponsor the gathering of crystallographic data in their countries. These countries are now represented on the Commission. The British National Data Committee reported an active program which is resulting in a considerable number of additions to powder diffraction data. Their report has been forwarded to the other National Data Committees where it is hoped that it will serve to inspire and guide their work.

Commission on Crystallographic Nomenclature

Recommendations of the Commission were presented to the Second General Assembly and are set out in detail in the report of that meeting.

Joint Commission on Physics Abstracting

The Commission has achieved a great measure of co-operation between *Science Abstracts* and the *Bulletin Analytique*, and has recommended to the International Council of Scientific Unions that its activities should be taken over and continued by a permanent body representing I.C.S.U. and the co-operating abstracting services only. This recommendation was accepted and the Joint Commission has accordingly been dissolved.

Joint Commission on Electron Microscopy

The International Council of Scientific Unions has established a Joint Commission on Electron Microscopy. The International Union of Pure and Applied Physics is the 'mother Union' for this Commission, and other Unions have been invited to appoint representatives. The Executive Committee of the International Union of Crystallography has nominated as its representative R. W. G. WYCKOFF (National Institute of Health, Bethesda 14, Maryland, U.S.A.) with whom crystallographers interested in the work of this Commission are invited to communicate.

Commission on Macromolecules of the International Union of Pure and Applied Chemistry

A sub-committee on nomenclature has had extensive correspondence on many difficult problems such as the systematic naming of substances and the definitions of the properties of solutions. These were discussed at the Conference in New York in September 1951. A final report has not yet been issued.

A sub-committee on molecular-weight standards has collected results obtained on standard specimens by various methods in many laboratories.

A survey of existing research laboratories which carry out work on macromolecules is being made, and a list will be circulated.

Commission on Solid-State Physics of the International Union of Pure and Applied Physics

The International Union of Pure and Applied Physics has established a Commission on Solid-State Physics and has invited certain other Unions to appoint representatives. The Executive Committee of the International Union of Crystallography has nominated as its representatives P. P. EWALD (U.S.A.), A. GUINIER (France) and W. H. TAYLOR (U.K.). Crystallographers interested in the work of this Commission are invited to communicate with its Secretary (P. P. EWALD, Polytechnic Institute of Brooklyn, 99 Livingston Street, Brooklyn 2, N.Y., U.S.A.).

International Council of Scientific Unions

The Union was represented by P. P. EWALD at the meeting of the Executive Board of the International Council of Scientific Unions held on 16 and 17 October 1951 at the National Academy of Sciences in Washington. Among the items of business discussed were the following:

New statutes were formulated for submission to the General Assembly of the International Council of Scientific Unions to be held in Amsterdam in 1952.

Several applications for the admission of new Unions were considered but none was accepted. A report of the Policy Committee on the admission of new Unions was adopted for submission to the General Assembly.

The activities of Joint Commissions of three years standing were reviewed and rules for Joint Commissions were adopted. It was agreed to form a new Joint Commission on Electron Microscopy with the International Union of Pure and Applied Physics as 'mother Union', and with representatives of other interested Unions, including that of Crystallography. It was further agreed to dissolve the Joint Commission on Physics Abstracting and to establish an international abstracting service under the International Council of Scientific Unions.

It was reported that UNESCO was calling upon the Unions to increase the proportion of the costs of grant-aided projects borne by themselves, and Unions were urged to consider means of achieving this objective.

Finances

The audited accounts of the Union for the year 1951 are published elsewhere in this issue (*Acta Cryst.* (1952), 5, 555). Once again the Union has been fortunate in receiving substantial contributions towards the expenses

of its work from UNESCO (£3036), from British industrial and other organizations (£2452) and from the U.S. National Research Council (£1775). Since the formation of the Union in 1947 a total of £25646 has been received in this way (£14363 from UNESCO, £8608 from British and £2675 from American sources). These most generous subventions have contributed greatly to the work of the Union, for without them many of its activities would have been quite impossible. Even so, the future is not without financial anxiety, and it is clear that the price of the publications of the Union will ultimately have to be set at a level which will make them nearly self-supporting.

The expenses of producing *Acta Crystallographica* in 1951 exceeded income by £241 in spite of the receipt of a subvention of £1635; this deficit was met from balances brought forward from earlier years. In 1952 the increased subscription rate will operate, but the growth of the journal is so rapid that it is likely that a deficit will again arise.

The expenses of producing *Structure Reports* exceeded receipts by £689 and this deficit was met from balances brought forward, leaving a balance of only £552 to the credit of the *Structure Reports* account. The expenses in 1951 were, however, abnormally heavy because they included the whole cost of printing Vol. 11, the proceeds from the sales of which are likely to accrue over a number of years.

No expenses were incurred in the preparation of *International Tables* in 1951 and a balance of £6393 stands to the credit of this account. A large part of this sum will be required in 1952 to meet the cost of printing Vol. 1.

Part of the above-mentioned subvention from the U.S. National Research Council was credited to a new General Publications Fund to be used as required for the benefit of the three major publications of the Union.

Income of the General Fund exceeded expenditure in the year by £447 and a total of £2597 now stands to the credit of this account.

Membership of Committees, Commissions and other bodies

The membership of Committees, Commissions and other bodies on 31 December 1951 was as follows:

Executive Committee

<i>President:</i>	J. M. BIJVOET (Netherlands)
<i>Vice-Presidents:</i>	G. HÄGG (Sweden) J. WYART (France)
<i>General Secretary:</i>	R. C. EVANS (U.K.)
<i>Editor:</i>	P. P. EWALD (U.S.A.)
<i>Ordinary Members:</i>	J. D. BERNAL (U.K.) SIR K. S. KRISHNAN (India) E. ONORATO (Italy) A. L. PATTERSON (U.S.A.)

Acta Crystallographica Advisory Board

SIR LAWRENCE BRAGG (U.K.)
M. VON LAUE (Germany)
C. MAUGUIN (France)
P. NIGGLI (Switzerland)
L. PAULING (U.S.A.)
R. W. G. WYCKOFF (U.S.A.)

Commission on Acta Crystallographica

<i>Chairman:</i>	P. P. EWALD, Polytechnic Institute of Brooklyn, 99 Livingston Street, Brooklyn 2, N.Y., U.S.A.
<i>Other Members:</i>	R. C. EVANS (U.K.) I. FANKUCHEN (U.S.A.) J. WYART (France)

Commission on Structure Reports

<i>Chairman:</i>	A. J. C. WILSON, Physics Department, University College, Cardiff, Wales.
<i>Other Members:</i>	N. C. BAENZIGER (U.S.A.) C. S. BARRETT (U.S.A.) J. M. BIJVOET (Holland) A. GUINIER (France) G. HÄGG (Sweden) F. W. MATTHEWS (Canada) I. NITTA (Japan) H. O'DANIEL (Germany) J. M. ROBERTSON (U.K.)

Commission on International Tables

<i>Chairman:</i>	K. LONSDALE, Chemistry Department, University College, London W.C. 1, England.
<i>Other Members:</i>	M. J. BUERGER (U.S.A.) N. F. M. HENRY (U.K.) C. H. MACGILLAVRY (Netherlands) J. S. KASPER (U.S.A.)

Commission on Crystallographic Apparatus

<i>Chairman:</i>	A. GUINIER, Conservatoire des Arts et Métiers, 292 Rue St Martin, Paris 3, France.
<i>Other Members:</i>	J. L. AMOROS (Spain) M. J. BUERGER (U.S.A.) E. G. COX (U.K.) G. HÄGG (Sweden) W. PARRISH (U.S.A.) H. P. ROOKSBY (U.K.) E. H. WIEBENGA (Netherlands)

Commission on Crystallographic Data

<i>Chairman:</i>	F. W. MATTHEWS, Canadian Industries Ltd., McMasterville, Quebec, Canada.
<i>Other Members:</i>	F. A. BANNISTER (U.K.) D. HARKER (U.S.A.) T. ITO (Japan) C. H. MACGILLARY (Netherlands) J. ROSE (France) J. N. VAN NIEKERK (South Africa) A. J. C. WILSON (U.K.) E. A. WOOD (U.S.A.)

Commission on Crystallographic Nomenclature

<i>Chairman:</i>	W. L. BOND, Bell Telephone Laboratories, Murray Hill, N.J., U.S.A.
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Other Members: F. A. BANNISTER (U.K.)
H. BRASSEUR (Belgium)
J. D. H. DONNAY (U.S.A.)
W. DE KEYSER (Belgium)
K. LONSDALE (U.K.)

*Joint Commission on Electron Microscopy of the
International Council of Scientific Unions*

Representative: R. W. G. WYCKOFF, Laboratory
of Physical Biology, National
Institute of Health, Bethesda 14,
Maryland, U.S.A.

*Commission on Macromolecules of the International
Union of Pure and Applied Chemistry*

Representative: C. W. BUNN, I.C.I. (Plastics) Ltd.,
Black Fan Road, Welwyn Garden
City, Herts, England.

*Commission on Solid-State Physics of the International
Union of Pure and Applied Physics*

Representatives: P. P. EWALD, Brooklyn Polytechnic
Institute, 99 Livingston Street,
Brooklyn 2, N.Y., U.S.A.
A. GUINIER (France)
W. H. TAYLOR (U.K.)

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).

Fourier Synthesis and Structure-Factor Calculations

Messrs John Smith & Son (Glasgow) Ltd, 26-30 Gibson Street, Hillhead, Glasgow W.2, Scotland, announce that their 3-figure cosine factor sets have been extended, with an improved type of Perspex board, to cover the index range $h = 0$ to $h = 45$ at 120ths of the cell edge. The original set covered index values from 0 to 22. A supplementary set of stencils or masks can now be supplied together with additional boards which extend the index range to 45. Preparations are also being made to produce a set of masks for structure-factor calculations, at parameter values in multiples of 1/1000ths of the cell edge, for the index range 0 to 30, using the method prescribed by Robertson (*J. Sci. Instrum.* (1948), 25, 28). Further information may be obtained from the publishers, Messrs John Smith & Son, at the above address.

International Union of Crystallography

1. Notice of adhesion, dated 3 April 1952, has been received from Austria through the Austrian Academy of Science. The number of Adhering Bodies is now 19.
2. Messrs Philips Gloeilampenfabrieken, Eindhoven, The Netherlands, have offered to the Union a generous donation of f. 5,000 (approximately £500) for each of the years 1952 and 1953 as a contribution towards the expenses of its publications and other activities.

Pittsburgh Diffraction Conference

The Tenth Annual Pittsburgh Diffraction Conference will be held at Mellon Institute of Industrial Research, Pittsburgh 13, Pa., U.S.A., on 6 and 7 November 1952.

Technical sessions are being arranged on 'Instrumentation and Methods' and on 'Neutron Diffraction and General Diffraction Studies'. Contributed papers on these and related subjects will be considered in the order in which they are received. Titles should be submitted to the Program Chairman, Mr R. K. Scott, Hall Laboratories Inc., Box 1346, Pittsburgh 30, Pa., U.S.A. before 1 September 1952.

The conference will include a symposium of invited papers in the field of 'Order-Disorder Studies'.

For further information, and for a copy of the preliminary program when available, write to Mr E. E. Wicker, U. S. Steel Company, Research and Development Laboratory, 234 Atwood Street, Pittsburgh 13, Pa., U.S.A.

Diffusion thermique des rayons X par des monocristaux de fer- α et dynamique du réseau cubique centré: correction

In the above Short Communication by Curien (*Acta Cryst.* (1952), 5, 393) an error occurs in the frequency scale in Fig. 1. The number ' 5×10^{11} ' should be replaced by ' 50×10^{11} ', and this value applies to the fifth subdivision along the frequency axis.

Crystallographic data for certain alkaloids: correction

In the above Short Communication by Griffiths (*Acta Cryst.* (1952), 5, 290) the first sub-heading should read 'Quinidine sulphate dihydrate'. In the final paragraph the compound referred to should read 'cinchonamine'.