

International Union of Crystallography

Seventh General Assembly, International Congress and Symposium on Crystal Growth

By invitation of the Academy of Sciences of the U.S.S.R. the Seventh General Assembly and International Congress of the Union, and the subsequent Symposium on Crystal Growth, were held in Moscow from 12 to 21 July 1966. With the exception of the Opening Ceremony and the first session of the Assembly, which both took place in the Kremlin Palace of Congresses, the meetings were held in the Main Building and the Faculty of Physics of Moscow State University.

The total number of participants in the meetings was almost twice as large as the attendance at the corresponding meetings in 1963. The Congress and Symposium were attended by 1536 scientists and 297 accompanying members from the U.S.S.R., and 1086 scientists and 266 accompanying members from the following thirty-three countries: Argentina, Australia, Austria, Belgium, Bulgaria, Canada, Chile, Czechoslovakia, Denmark, Finland, France, Germany (B.R.D. and D.D.R.), Greece, Hungary, India, Israel, Italy, Japan, Morocco, Netherlands, Norway, Pakistan, Poland, Portugal, Rumania, Spain, Sweden, Switzerland, Tunisia, U.K., U.S.A., and Yugoslavia.

The Assembly and Congress were formally opened on Tuesday afternoon 12 July. The Chairman of the Soviet Organizing Committee, Professor B.K. VAINSHTEIN, presided over this opening session. In his opening speech he showed the importance of the science of crystallography by giving examples of recent achievements obtained by crystallographic research, and of the technical applications which had become possible in this way. He then read a message to the Congress from Professor J.D. Bernal, who owing to illness had been unable to come to Moscow and only a few weeks earlier had decided to resign as President of the Union. Academician V.A. KIRILLIN, in his capacities of Deputy Chairman of the Council of Ministers of the U.S.S.R. and Chairman of the State Committee on Science and Technology, was the next speaker. After extending his best wishes to the members of the Congress for a successful meeting, and to the foreign guests for a pleasant and fruitful stay in the U.S.S.R., he expressed the hope that apart from the scientific results of the Congress, this meeting of scientists from different countries would also further good international relationships. The Vice-President of the Academy of Sciences of the U.S.S.R., Academician B.P. KONSTANTINOV, welcomed the members of the Congress on behalf of the Academy. In his speech he stressed the practical applications which crystallography had always had, in the beginning with mineralogy, with mining as its major application, and with the creation of new materials and the production of various kinds of synthetic crystals, including diamonds, as great successes achieved recently. The Deputy Mayor of the City of Moscow, L.V. BACKMETKOV, then spoke on behalf of the City Soviet. In his speech of welcome he expressed the hope that the participants of the Congress would take the opportunity to get acquainted with the City of Moscow, to see its tremendous building activities, and to enjoy its theatres, museums and other cultural institutions. Dame KATHLEEN LONSDALE, who as Senior Vice-President of the Union had taken Professor Bernal's office of President, was the last speaker. After extending Professor Bernal's personal greetings to

the members of the Congress, she summarized the most important results of the work of the Union, and in particular of its successful publication programme. On behalf of the Union and of the members of the Congress, she expressed thanks to the Government of the U.S.S.R., the City of Moscow, the Academy of Sciences of the U.S.S.R., the Soviet Organizing Committee, and to all those who had helped in the preparations for the meetings.

The last event of the Opening Ceremony was a beautiful colour film on the growth of crystals.

The Assembly and Congress were formally closed on Tuesday afternoon 19 July in the Assembly Hall of the University. After Dame KATHLEEN LONSDALE had opened this Closing Session, Academician A.V. SHUBNIKOV gave a short speech. Professor B.K. VAINSHTEIN then presented the prizes for the most beautiful contributions to the photographic exhibition to the winners: E.V. Tsinzerling, A.I. Gorshkov & N.D. Samotoin and A. Zborilek. Subsequently three votes of thanks were passed which are mentioned in more detail in the next chapter (see section 26, paragraphs *d*, *e* and *f*); and those books of the book exhibition which were not on loan were given by Dame KATHLEEN LONSDALE to Professor Vainshtein for distribution to Soviet libraries. She thanked again the retiring Officers of the Union for their work, in particular Professor P.P. Ewald, who since the establishment of the Union had served on the Executive Committee in various offices, and Dr D.W. Smits for his twelve years of service as General Secretary. The newly elected President, Academician N.V. BELOV, was the last speaker. After expressing his thanks to all who had participated in the organization of the meetings, he gave a summary of the development of the science of crystallography in the U.S.S.R. The meetings were then formally closed by Dame KATHLEEN LONSDALE.

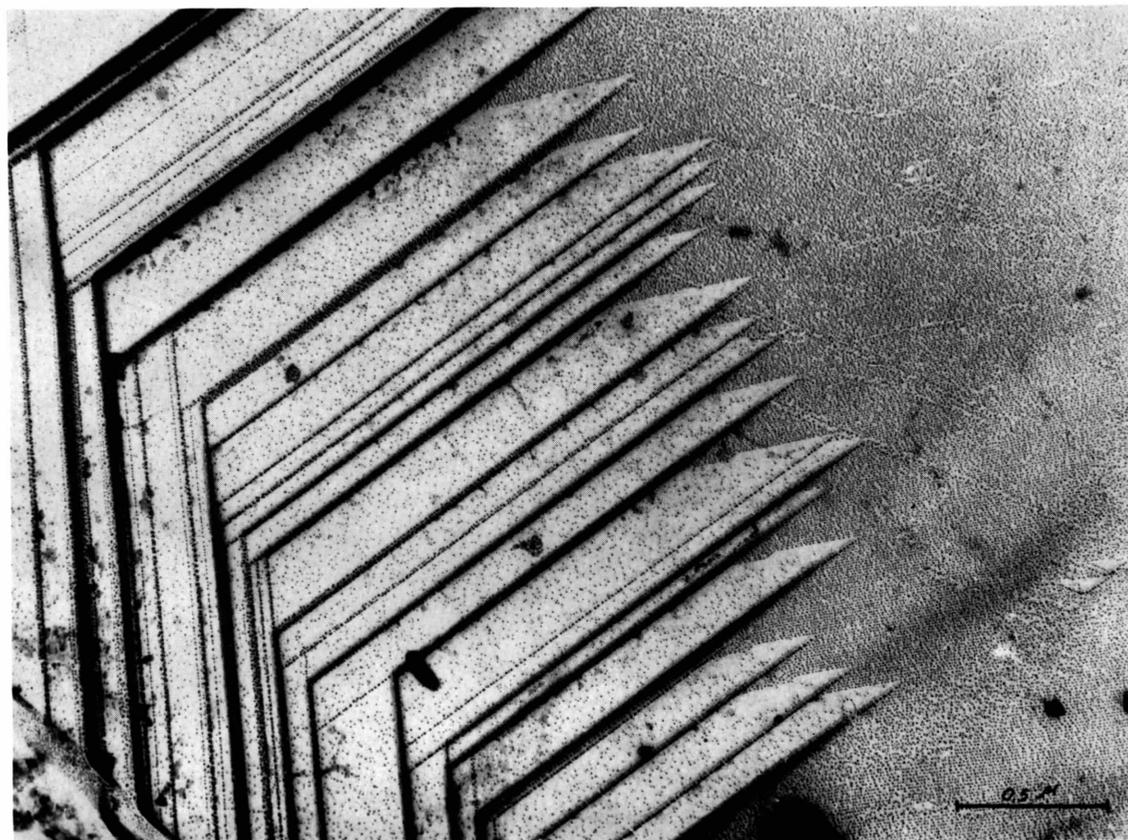
Seventh General Assembly

Twenty-five Adhering Bodies, including the new members whose adherence was ratified in Moscow, were represented by delegates. The Chilean delegate, N. Joel, was also official representative of UNESCO. The secretaries of the National Committees for New Zealand and South Africa had written that no representatives from their countries would be attending the Assembly and Congress. The delegate appointed by the Pakistan Council of Scientific and Industrial Research had not been able to come to Moscow. No delegates had been appointed by the Adhering Bodies for Belgium and Brazil.

The first session of the Assembly was held in the Kremlin Palace of Congresses after the Opening Ceremony on Tuesday afternoon 12 July. The Assembly met again in the Main Building of the University on Friday evening 15 July and on Tuesday afternoon 19 July. A detailed report of the work of the Assembly will be published separately, and be sent to the Secretaries of the National Committees. The following is a summary of the business transacted.

(1) *Adhering Bodies*

(a) Adherence to the Union in Group I of the Polska Akademia Nauk [Polish Academy of Sciences] and of the



One of the prize-winning contributions to the photographic exhibition. A. I. GORSHKOV & H. D. SAMOTOIN (U.S.S.R.).
Dikite. Microcrystal surface decorated with Au.

Jugoslavenska Akademija Znanosti i Umjetnosti [Yugoslav Academy of Sciences and Arts] was approved.

(b) The change of the joint membership of the West and East German crystallographers through the Deutsche Mineralogische Gesellschaft, which has its seat in West Germany, into a joint membership with an Adhering Body to be formed by this Society and by the Deutsche Vereinigung für Kristallographie, which has its seat in East Germany, was approved. The previous German joint National Committee was replaced by a Regional Committee for Crystallography of the B.R.D. and the D.D.R.

(c) The changes in membership of the Australian Academy of Science and of the Consiglio Nazionale delle Ricerche [Italy], each from one in Group II into one in Group III, and of the Société Suisse de Minéralogie et de Pétrographie from one in Group I into one in Group II, were approved. The Adhering Body for Australia had requested that the increase in its membership should be effective as from 1967; the two other changes became effective immediately.

(2) Minutes of the Sixth General Assembly

The minutes of the meetings of the Sixth General Assembly, held in Rome, Italy, on 9, 10, and 14 September 1963, were approved.

(3) Amendments to Statutes and By-Laws

(a) A set of amendments to the Statutes and By-Laws were adopted which had been proposed by the Executive Committee. The main purpose of the amendments was the creation of a separate Treasurership, *i.e.* that in addition to the previous eleven Officers of the Union a Treasurer be elected. The Statutes and By-Laws in their new form will be included in the detailed report of the Seventh General Assembly.

(b) A proposal from the U.S.A. National Committee that the Assembly should consider appropriate amendments to the By-Laws to provide for an improved procedure for the nomination and election of the Chairmen and members of the Commissions was introduced to the Assembly, but it was agreed that action by the Assembly on any such amendments be postponed until 1969. It was further agreed that a Sub-committee, with D.W. Smits as Convener, and D.P. Shoemaker and A.J.C. Wilson as members, should scrutinize the Statutes and By-Laws, and make recommendations for amendments to the Executive Committee during the period until the Eighth General Assembly.

(4) Statutory Reports

The statutory reports of the Executive Committee, of the Commissions of the Union, and of the Representatives on bodies not belonging to the Union, were taken as read. In addition to these reports, verbal reports were given on later activities and on matters discussed in Moscow by the bodies concerned. The reports are summarized in the next sections.

(5) Commission on Acta Crystallographica

The Editor of the journal, A.J.C. WILSON, reported that in addition to its normal business, the Commission had discussed proposed new journals of the Union (see section 19 below). The Commission was of the opinion that there

is a need for a journal in the field of applied crystallography, but it was not so happy about the suggestion of a separate journal in the field of crystal physics. It was felt that the ideal solution, if it could be achieved, would be an increase of the proportion of papers in crystal physics in *Acta Crystallographica* to one-third or higher. If it were thought that sufficient authors of papers in this field could not be attracted to the present *Acta*, the Commission would recommend the publication of *Acta* in two parts: *A* (physical) and *B* (chemical).

The Commission had also discussed a number of technical matters concerned with the production of the present *Acta Crystallographica*. It was decided that from January 1967 onwards Short Communications be printed with an accompanying abstract.

The President reported that after consultation with the members of the *Acta Crystallographica* Advisory Board, the Executive Committee had decided to dissolve this body. Originally the Board had consisted of six members, but meanwhile three of these had died. The remaining three members had all agreed that there was no reason for the Board to continue.

(6) Commission on Structure Reports

The Editor of *Structure Reports*, W. B. PEARSON, explained that the main problem with which the Commission was faced was how to maintain the standard of the reports on good structure determinations, in the face of the increasing volume of literature and the difficulty of finding experienced Co-editors, who have the time and intention to do the work reasonably rapidly. At its meetings in Moscow, the Commission had decided that full emphasis should be given to the production of critical reports of good structure determinations, even if this should mean that other information now reported would be neglected. It was further decided to investigate what information could be omitted, and to what extent determinations of cell dimensions could be presented in tabular form. The Commission also considered in detail what use could be made of computers, *e.g.* for calculating distances and coordination polyhedra, for obtaining plots or views of structures, *etc.* Access to computer services appeared to be possible for the Metals and the Organic Section, and after two or three years probably also for the Inorganic Section. No help from computers was expected, however, to lighten the Editor's burden of searching the literature and preparing the lists of papers to be reported.

At the end of his report, the Editor recalled the great service that Professor J.M. Bijvoet had rendered to the Commission over a period of almost twenty years; and he regretted that Professor Bijvoet had been unable to be present at the final meeting before his resignation.

(7) Commission on International Tables

In the absence of the Editor, N.F.M. Henry, who had not come to Moscow, the reports of the Commission were presented by the Co-editor TH. HAHN. He reported that the Commission was actively engaged in the preparation of a 'pilot' edition for a completely revised and extended new edition of *International Tables*. The objects of this 'pilot' edition would be to try out methods of presentation, and to involve crystallographers from many countries in the large task of reaching final editorial decisions. Copies of the

'pilot' edition would be made available to interested crystallographers who are willing to cooperate and to send their comments within a reasonable period of time.

(8) *Commission on Crystallographic Apparatus*

In his first report to the Assembly, the Chairman of the Commission, A. MCL. MATHIESON, outlined the reasons for the request of the Commission to hold in 1968 a small Inter-Congress meeting on 'X-ray Intensity Measurements from Single Crystals and Powders'. This meeting is intended for specialists in this field, with limited attendance, and there will be adequate opportunity for detailed discussions. (See also section 21(b).)

At the final session of the Assembly, Dr Mathieson reported on the three open sessions which the Commission had held in Moscow. At the session on the 'Single Crystal Intensity Project' a report was given of the preliminary results of this project undertaken by the Commission, followed by detailed discussions. The second open session was on 'Novel Detectors for X-rays', and eight papers were presented. At the third open session the proposals for a 'Powder X-ray Intensity Project' were discussed.

(9) *Commission on Crystallographic Computing*

The Chairman of the Commission, D. W. J. CRUICKSHANK, reported that the editorial work for the 2nd edition of the *World List of Crystallographic Computer Programs* had been completed, and that this compilation was expected to be ready for distribution before the end of the year. He further drew attention to the open session of the Commission, at which a number of invited lectures would be given.

(10) *Commission on Crystallographic Data*

In his report to the Assembly, the Chairman of the Commission, J. D. H. DONNAY, mentioned the document entitled 'Primary Crystallographic Data', which contains a detailed list of recommendations on the presentation of crystallographic data in primary publications. Subject to further consideration of some points of nomenclature, the document had been approved by the Executive Committee.

Among the topics discussed by the Commission in Moscow was the question what use could be made of computers for data compilation. The Commission had further decided to prepare a set of recommendations dealing with the presentation of powder data.

(11) *Commission on Crystallographic Nomenclature*

The Chairman of the Commission, A. J. C. WILSON, reported a recommendation by the Commission that the new edition of *International Tables for Crystallography* should contain a full exposition of Hermann-Mauguin symbols for molecular (non-crystallographic) symmetry. The Commission had further recommended that the symbols for dimensional atomic coordinates be *X, Y, Z*. This was the systematic practice in *Structure Reports*, and the usual practice in *Acta Crystallographica*. Other use of these letters, in *International Tables* and elsewhere, would not ordinarily lead to any confusion.

(12) *Commission on Crystallographic Teaching*

At the first session of the Assembly, the Chairman of the Commission, A. J. FRUEH, JR, drew attention to the 'Report on the Status of Crystallography and Crystallographic Research', which the Commission had prepared at the request of the Sixth General Assembly. This report was presented to and discussed by the Assembly at its second session. Although the report did not cover the situation in all countries where crystallography is studied or crystallographic research is carried out, it was considered a useful document, in particular for those who try to press for the recognition of crystallography as a formal teaching discipline.

The Secretary of the Commission, H. CURIEN, reported at the final session of the Assembly about the meetings of the Commission in Moscow. He particularly mentioned the intended publication of a book containing reprints of historic papers in crystallography published since the discovery of the diffraction of X-rays by crystals. It was the intention that first a 'pilot' edition be prepared, copies of which would be sent to a number of senior crystallographers asking them for their help in selecting the most suitable papers.

(13) *Commission on Electron Diffraction*

The Chairman of the Commission, H. A. RAETHER, reported on plans for a meeting in London in July 1967, to commemorate the 40th anniversary of G. P. Thomson's original paper on electron diffraction. The Institute of Physics and The Physical Society had agreed to be responsible for organizing the meeting, which would probably be held at Imperial College. It was proposed that the Union, through the Commission on Electron Diffraction, should be co-sponsor. (See also section 21(a).)

(14) *Sub-committee on Structure-type Designation*

The Convener of this Sub-committee, F. H. LAVES, explained that it was set up in 1963 as a consequence of the wish of the Commission on *Structure Reports* that a nomenclature or symbolism of structure types be included in the next General Index volume. Although after informal discussions and by correspondence some suitable principles had emerged for the designation of structure types of metals and metallic compounds, the Sub-committee had not made much progress. As it did not impose a financial burden on the Union, it was agreed that it be continued.

(15) *Representation on other bodies*

(a) In his written report to the Assembly, the Representative on the Commission on the Solid State of the International Union of Pure and Applied Physics, F. H. LAVES, had listed the international conferences in the years 1963-1966 for which the Commission had proposed sponsorship by IUPAP. In his verbal report to the Assembly, he drew attention to two meetings planned for 1968, *viz.* an 'International Conference on Ferroelectricity' in Japan, and the 'Second International Conference on Crystal Growth' in the U.K. He felt that the Union should consider co-sponsorship of the latter conference.

During the later discussion of the proposal for the formation of a Commission on Crystal Growth (see section 17 below), it was explained that the request for co-spon-

sorship by the Union of the first 'International Conference on Crystal Growth', which was held in Boston, Mass., in June 1966, had been received at such short notice that the Executive Committee had not had sufficient time and opportunity for a due consideration of this request.

(b) The Observer on the ICSU Abstracting Board, W.B. PEARSON, reported on the meeting which the Board had just held in Paris from 6 to 9 July 1966. A point of direct interest to the Union was the comparison of the major journals in physics for the year 1964, in which *Acta Crystallographica* was included, and from which it appeared that as regards the average cost to the consumer per 10,000 words, *Acta Crystallographica* compared very favourably with the other journals. On the other hand, however, its average time for publication in 1964 of 10 months compared badly with a world average of about 6 months. Another interesting point was that the cost of *Structure Reports* to the consumer per 10,000 words was about the same as the average cost of all primary publications in physics (journals published commercially and those sponsored by societies), although *Structure Reports* lies between a secondary and tertiary publication, the prices of which are considered to be much higher than those of primary publications.

During the discussion, it was commented that the time of publication of *Acta Crystallographica* had meanwhile been reduced to an average of 8 months in the middle of 1966.

(c) The Chairman of the Commission on Crystallographic Teaching, A.J. FRUEH, JR, in his capacity of Representative on the ICSU Inter-Union Commission on Science Teaching, reported that the ICSU Commission was considering participation in a project sponsored by UNESCO on the integration of science curricula at the upper secondary and lower University levels, to be closely coordinated with the recently integrated mathematics programmes.

(d) A report on the first meeting of the ICSU Committee on Data for Science and Technology, which had been held in Paris, France, on 16 and 17 June 1966, was given by J. WYART, who had attended this meeting as representative of the Union. He reported that the Committee had replaced the previous ICSU Working Group on Critical Tables, which was set up in 1964 and had carried out the preparatory work for the new ICSU Committee. The objects of the Committee will be to collect, scrutinize and publish numerical scientific and technical data. At the meeting in Paris it was decided that the Committee would consist of 18 members, including representatives of the International Scientific Unions; and that the Committee should meet at least once per year. A Bureau was elected consisting of a President, two Vice-Presidents, a Secretary-Treasurer and an Executive Director.

(16) *Establishment of a Commission on Neutron Diffraction*

Following the recommendations included in the final report which G.E. BACON had made at the request of the Executive Committee, it was decided that a Commission on Neutron Diffraction be set up, which should have the following functions:

- (a) Tabulation and critical evaluation of data on the neutron scattering amplitudes of elements and isotopes, including complex scattering amplitudes, and of magnetic form factors.
- (b) Collection of information and recommendations on technical procedures.

(c) Cataloguing of information on reactor types, neutron flux, background, instrumentation, methods of data collection and handling, etc.

(d) Encouragement of the publication of monographs, and cooperation with the Editors of *Structure Reports* for the description of magnetic structures.

(e) Support for and organization of Symposia.

(17) *Proposed establishment of a Commission on Crystal Growth*

The proposal was made and discussed that a Commission on Crystal Growth be set up by the Union. Different opinions were expressed, however, about parts of a report, which at the request of the Executive Committee had been made at short notice by N.N. Sheftal. It was felt that the decision to set up the Commission could not be made on the basis of this report, but also that the matter could not be postponed until the next General Assembly in 1969. The Assembly therefore authorized the new Executive Committee to proceed with the formation of a Commission on Crystal Growth.

[In accordance with this authorization, the Executive Committee later approved of the establishment of a Commission on Crystal Growth, and appointed a Chairman and seven members whose names are included in section 27 below.]

(18) *Proposal for the establishment of a Commission on Crystallographic Studies at Pressures and Temperatures other than Normal*

Some discussion was devoted to a proposal that the Union should set up a Commission on Crystallographic Studies at Pressures and Temperatures other than Normal. Although it was felt that the proposed Commission could have useful functions, and that the Union should be alert to its opportunities in the field concerned, the matter was not considered so urgent as to make it necessary that the Commission be set up earlier than at the Eighth General Assembly. It was therefore agreed that the Executive Committee should ask someone to consider the proposal on its merits, and if he were in favour of the establishment of the proposed Commission, to draft its terms of reference and to make a recommendation for membership.

(19) *Discussion of the publication programme*

The President reported that the Sixth General Assembly in 1963 had authorized the Executive Committee to continue with the preparations for a Journal of Applied Crystallography, but that the Executive Committee had not been successful in finding a suitable person who was in a position and willing to be appointed as Editor. She further reported that during the last year the proposal was made that the Union should consider the publication of a Journal of Crystal Physics. It had been felt that *Acta Crystallographica* had become too specialized in crystal chemistry, and that its publication time was much longer than that of other journals which accept papers on crystal physics.

During the discussion it was stressed that the publication programme of the Union should indeed more adequately cover the field of interests of the Union. Although there was no editorial reason why papers on crystal physics should not be published in *Acta Crystallographica*, the number of

such papers submitted to *Acta* was low, and it was felt that they got lost between structure papers.

After some further discussion, the Assembly decided that the (new) Executive Committee should be asked to set up a Publications Sub-committee, to consider the publication policy and programme of the Union and to report back to the Executive Committee; and be authorized to act on the proposals of this Publications Sub-committee.

At the third session of the Assembly, the President reported that A. Guinier had been asked and agreed to serve as Editor of a Journal of Applied Crystallography, if such a journal were launched by the Union. The Editor of *Acta Crystallographica* further reported that his Commission had also discussed the proposed journals (see section (5) above).

(20) *UNESCO Pilot Project on the Teaching of Crystallography and the Physics and Chemistry of Solids at the University Level*

The representative of UNESCO, N. JOEL, introduced the plans for the above pilot project, of which UNESCO was considering sponsorship, and which should take place during the period 1967–1970. The aim of the project would be to carry out research and development work leading to the production of new teaching materials. Emphasis was laid on these new materials because it was thought that this might influence significantly the improvement of science teaching. One of the first steps to be taken would be the formation of a panel of experienced top-level scientists, to cooperate with UNESCO, and possibly other groups, in the planning of the pilot project and carrying out its first stages.

After some discussion, during which some objections to the plans were raised, the Assembly agreed that the Commission on Crystallographic Teaching should be asked to set up the proposed panel, which would advise and report to UNESCO, and to cooperate with this panel in the initiation of the further stages of the project.

(21) *Inter-Congress meetings*

The proposed arrangements for the following meetings planned for the period until the Eighth General Assembly were approved, and the Executive Committee and the Commissions concerned were authorized to continue with the preparations:

- (a) the Anniversary Meeting on Electron Diffraction in London, probably from 3 to 5 July 1967, in the organization of which the Commission on Electron Diffraction would participate (compare section 13 above); and
- (b) the Inter-Congress meeting on 'X-ray Intensity Measurements from Single Crystals and Powders', planned by the Commission on Crystallographic Apparatus, to be held in Europe, probably in July 1968 (compare section 8 above).

(22) *Eighth General Assembly and International Congress*

(a) The invitation from the U.S. Academy of Sciences to hold the Eighth General Assembly and International Congress in 1969 in the U.S.A. was accepted. The Chairman of the U.S.A. delegation, G.A. JEFFREY, explained why after due consideration his National Committee had decided to choose the University of New York at Stony

Brook on Long Island as location for the meetings; and that the only possible period would be during the last two weeks of August.

(b) At its second and third session, the Assembly spent some time on the discussion of the future policy of the Union. It was felt that the field of interests of the Union was larger than that usually covered by the programmes of its scientific meetings, and that there was a need for more specialized Symposia. It was also felt that the attendance at the Congresses had reached a limit which would not allow the Union to continue in the same way. A drastic change was proposed by W.B. PEARSON, who suggested that instead of 'abstract sessions' of contributed papers, on each day of the Congress only three main lectures should be given on selected and possibly related topics of current interest, two in the morning and one late in the afternoon, so that there would be sufficient time in the afternoons for the Commissions to have their meetings and open sessions, and for the General Assembly to conduct its business.

After the discussions, the Assembly agreed that the Executive Committee should set up an Advisory Panel, to suggest ideas about the most suitable organization of the Eighth Congress to the Programme Committee for this Congress, but without any obligation for the Programme Committee to accept the advice and plans of the Panel.

(23) *Finances*

(a) The financial report based on the audited accounts for the years 1963, 1964 and 1965 was introduced to the Assembly by the General Secretary. He explained that the heavy loss suffered in 1965 in the *Acta Crystallographica* account was caused by the large increase in the size of the journal, and that as from 1966 the subscription prices had been increased substantially. The other publication accounts had been most satisfactory, but the General Fund had also suffered a deficit during the three-year period. This deficit, however, amounting to slightly more than f.19,000, was less than the estimated deficit of f.29,000 on the budget approved by the Sixth General Assembly in 1963. The report was accepted, and the General Secretary was discharged from liability to the Union.

(b) The budget estimates for general expenditure for the three years 1966, 1967 and 1968 were approved. The estimated income from subscriptions from the Adhering Bodies had been based on an increased unit contribution as from 1967.

(c) After some discussion, it was agreed that the unit contribution be increased from \$60 to \$100 as from 1967.

(24) *Appointment of Editors*

The following reappointments by the Executive Committee of the Editors of the three main publications of the Union, for the period until the Eighth General Assembly, were confirmed:

Acta Crystallographica: A. J. C. WILSON
Structure Reports: W. B. PEARSON
International Tables: N. F. M. HENRY

The Executive Committee later reported that it had approved the appointments by the above Editors of the Co-editors whose names are listed in the next section.

(25) *Elections*

Officers of the Union, Chairmen and members of the Commissions, and Representatives of the Union on other bodies, were elected. The new membership of the Executive Committee, the Commissions, *etc.*, is given below. When considering the list, the following points should be kept in mind: (a) one Vice-President and three Ordinary Members of the new Executive Committee were elected by the Sixth General Assembly to serve until the close of the Eighth General Assembly in 1969; (b) as Dame Kathleen Lonsdale had assumed the Presidency after Professor J.D. Bernal's resignation as President, she will hold the office of Retiring President until 1969; (c) according to the Statutes, the Editors and Co-editors are automatically members of the Commissions set up for their respective publications; (d) the Fifth General Assembly resolved that the Commission on Crystallographic Nomenclature should consist of the Editors of *Acta Crystallographica*, *Structure Reports* and *International Tables ex-officiis*, with the first Editor as Chairman; (e) the Chairman and members of the Commission on Crystal Growth were appointed by the Executive Committee after the close of the General Assembly (compare section 17 above); and (f) according to the By-Laws, the President, the General Secretary and the Treasurer are *ex-officiis* members of all Commissions.

*Executive Committee**President:*

N. V. BELOV* (U.S.S.R.)

Vice-Presidents:

I. NITTA* (Japan)

B. E. WARREN† (U.S.A.)

General Secretary:

G. BOOM*, Laboratorium voor Technische Natuurkunde der Rijksuniversiteit, Westersingel 34, Groningen, Netherlands

Treasurer:

D. W. J. CRUICKSHANK*, University of Manchester Institute of Science and Technology, Sackville Street, Manchester 1, England

Retiring President:

DAME KATHLEEN LONSDALE* (U.K.)

Ordinary Members:

J. M. COWLEY* (Australia)

H. CURIEN* (France)

H. JAGODZINSKI* (Germany)

A. LIŇEK† (Czechoslovakia)

A. M. LIQUORI† (Italy)

W. H. ZACHARIASEN† (U.S.A.)

*Commission on Acta Crystallographica**Editor and Chairman:*

A. J. C. WILSON, Department of Physics, University of Birmingham, P.O. Box 363, Birmingham 15, England

* Until the close of the Eighth General Assembly (1969).

† Until the close of the Ninth General Assembly (1972).

Co-editors:

H. JAGODZINSKI (Germany)

H. LIPSON (U.K.)

R. E. MARSH (U.S.A.)

S. MIYAKE (Japan)

Z. G. PINSKER (U.S.S.R.)

D. P. SHOEMAKER (U.S.A.)

J. WYART (France)

*Commission on Structure Reports**Editor and Chairman:*

W. B. PEARSON, Division of Pure Physics, National Research Council, Ottawa 2, Ontario, Canada

Co-editors:

E. BANKS (U.S.A.)

G. B. BOKY (U.S.S.R.)

I. D. BROWN (Canada)

P. J. BROWN (U.K.)

L. D. CALVERT (Canada)

J. DONOHUE (U.S.A.)

J. S. KASPER (U.S.A.)

H. W. KING (U.K.)

A. C. LARSON (U.S.A.)

A. MCL. MATHIESON (Australia)

M. V. NEVITT (U.S.A.)

C. E. NORDMAN (U.S.A.)

J. M. ROBERTSON (U.K.)

A. TAYLOR (U.S.A.)

J. TROTTER (Canada)

T. WATANABÉ (Japan)

Elected Member:

J. D. DUNITZ (Switzerland)

Ex-officio Member:

O. KENNARD (U.K.) (as Chairman of the Commission on Crystallographic Data)

*Commission on International Tables**Editor and Chairman:*

N. F. M. HENRY, Department of Mineralogy, Downing Street, Cambridge, England

Co-editors:

M. J. BUERGER (U.S.A.)

H. CURIEN (France)

TH. HAHN (Germany)

W. C. HAMILTON (U.S.A.)

E. HELLNER* (Germany)

J. A. IBERS (U.S.A.)

V. A. KOPTSIK (U.S.S.R.)

*Commission on Crystallographic Apparatus**Chairman:*

A. MCL. MATHIESON, Division of Chemical Physics, C.S.I.R.O., P.O. Box 160, Clayton, Vic., Australia

* Appointed Co-editor early in 1967.

Elected Members:

S. C. ABRAHAMS (U.S.A.)
 U. W. ARNDT (U.K.)
 W. C. HAMILTON (U.S.A.)
 F. H. HERBSTEIN (Israel)
 N. KATO (Japan)
 D. M. KHEIKER (U.S.S.R.)
 V. SCATTURIN (Italy)

*Commission on Crystallographic Computing**Chairman:*

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* Elected by the General Assembly as member, and ap-
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*ICSU Committee on Data for Science and Technology**Representative†:*

O. KENNARD, University Chemical Laboratory, Lensfield Road, Cambridge, England

(26) Votes of thanks

At the conclusion of the Assembly, the following votes of thanks were passed by acclamation:

(a) To UNESCO for their financial assistance which had enabled many scientists from abroad to participate in the meetings held in Melbourne in August 1965, and in Moscow in July 1966; and for their continued interest in other activities of the work of the Union.

(b) To the Australian Academy of Science for their invitation to the Union to co-sponsor the International Conference in Melbourne, and to the organizers of this Conference for their work in preparing the two successful Symposia on 'Electron Diffraction' and 'The Nature of Defects in Crystals'.

(c) To the resigning Officers for their assistance in the work of the Union; and in particular to the Retiring President P. P. Ewald, who had served in various offices on the Executive Committee since the establishment of the Union, and who more than any other could be considered as its founder; and to the General Secretary, D. W. Smits, for the considerable amount of work he had done with such great care during the twelve years of his service as General Secretary, which according to the Statutes had come to an end.

(d) To the Academy of Sciences of the U.S.S.R., through its President, M. V. Keldysh, for inviting the Seventh General Assembly and International Congress to Moscow; to Moscow State University, through its Rector, I. G. Petrovsky, for accommodating the meetings in the Main Building and the Faculty of Physics; and to the Deputy Chairman of the Council of Ministers of the U.S.S.R., V. A. Kirillin, and the Deputy Mayor of the City of Moscow, L. V. Backmetkov, for their welcome to the participants.

(e) To the Soviet Organizing Committee, in particular to its Chairman, B. K. Vainshtein, the Vice-Chairmen, A. N. Lobachev and I. S. Zheludev, and the Scientific Secretary, V. I. Simonov, for their splendid work in organizing the meetings; to the Programme Committee consisting of N. V. Belov (Chairman), A. Guinier, D. Harker, C. H. MacGillavry and Z. G. Pinsker, for their difficult task in preparing and

arranging the programme; and to N. N. Sheftal for organizing the Symposium on Crystal Growth.

(f) To the organizers of the exhibitions held on the occasion of the meetings in Moscow: M. M. Umansky for his efforts in connection with the exhibition of crystallographic apparatus and synthetic crystals; L. A. Feigin and H. D. Megaw for the excellent book exhibition; and N. V. Gliki and F. H. Herbststein for the magnificent exhibition of photographs of crystallographic interest.

*Seventh International Congress**(1) Scientific Programme*

The scientific programme of the Congress consisted of:

(a) A Congress Discourse on 'Antisymmetry' by A. V. SHUBNIKOV, which because of his illness was read by L. A. Shuvalov on 13 July.

(b) The following five General Lectures presented by invited speakers:

'Anomalous dispersion as a tool in structure determination' by G. N. RAMACHANDRAN;

'Electron deficient valencies in crystal structures' by W. N. LIPSCOMB;

'Problems in the physics of organic crystals' by A. I. KITAIGORODSKY;

'New ideas on isomorphous replacement' by N. V. BELOV; and

'Studies of biological systems by X-ray diffraction and electron microscopy' by H. E. HUXLEY.

The Congress Discourse and the General Lectures were given in the Assembly Hall, and simultaneous translation into the official languages of the Congress (English, French, German and Russian) was provided for.

(c) About 770 contributed papers, which according to their subjects had been arranged in seventeen divisions of the Congress, and were presented during the days of the Congress at eight to thirteen simultaneous morning and afternoon sessions. In addition, some Commissions had organized open sessions, at which papers were read and discussions held on topics of primary interest to the Commissions concerned.

According to the arrangements and rules made by the Programme Committee and approved by the Executive Committee, each author was allowed only one contributed paper in the programme. The average time available for the presentation of a contributed paper was set at 10 minutes, with a minimum of 5 and a maximum of 20 minutes, followed by 5 minutes for discussion. The session chairmen, who had been appointed by the division chairmen, were responsible for the organization of their sessions. Each session chairman was allowed to begin with an introductory talk, presenting the common background of the papers of his session. In addition to abstracts of their papers, authors had therefore been requested to send full outlines to their session chairmen. They had further been requested to prepare slides with an explanatory text in Russian if their papers were to be read in English, French or German, and *vice versa*.

A Russian and a western-languages edition of the Collected Abstracts of the papers presented at the Congress and the subsequent Symposium on Crystal Growth had been published, and copies had been distributed in advance to the registered participants. The western-languages edition will be reprinted as a Supplement to *Acta Crystallographica*, which will be sent free of charge to all subscribers to the journal.

* *Ex officio*, in their capacities of Chairman and Secretary, respectively, of the Commission on Crystallographic Teaching.

† *Ex officio*, in her capacity of Chairman of the Commission on Crystallographic Data.

(2) Exhibitions

On the occasion of the Assembly, Congress and Symposium, an International Exhibition of Crystallographic Apparatus, Synthetic Crystals and Books had been arranged for the period from 12 to 23 July.

(a) The exhibition of crystallographic apparatus and synthetic crystals was held in the Solnetchny Pavilion in the Moscow Central Stadium Luzhniki. Eighteen firms from eleven countries participated in the exhibition of commercially available apparatus. The middle part of the exhibition area was reserved for non-commercially available contributions; special mention may be made of the synthetic crystals on display, including diamonds, which drew much attention. This non-commercial part of the exhibition was organized under the auspices of the Commission on Crystallographic Apparatus by M. M. Umansky.

(b) As at previous Congresses, there was again a book exhibition, at which more than 1000 books and periodicals had been arranged according to subject. This book exhibition, which was located in the library of the Faculty of Physics, was organized under the auspices of the Commission on Crystallographic Teaching by L. A. Feigin and H. D. Megaw.

(c) An exhibition of photographs of crystallographic interest was arranged in the Main Building of the University. Almost 200 magnificent contributions had been received for this exhibition, which was organized under the auspices of the Commission on Crystallographic Apparatus by N. V. Gliki and F. H. Herbstein. At the close of the Congress prizes were awarded to the contributors of the three most beautiful photographs, which had been submitted by E. V. Tsinzerling (U.S.S.R.), A. I. Gorshkov & N. D. Samotoin (U.S.S.R.), and A. Zbořilek (Czechoslovakia) respectively. One of these prize-winning contributions is reproduced in this report.

(3) Social arrangements

On Tuesday evening 12 July the members of the Congress enjoyed a performance of the ballet 'Swan Lake' by the Bolshoi Ballet Group in the Kremlin Palace of Congresses.

For most participants this was a very unexpected event because they had expected to attend a concert as announced in the programme booklet. The Congress Banquet offered to the members of the Congress in the Kremlin Palace of Congresses on Tuesday evening 19 July was another unforgettable event.

For the period of the Congress, a number of excursions and visits to museums had been arranged, including a cruise by steamer on Sunday 17 July. For the accompanying members an additional entertainment programme had been arranged by a special Ladies' Committee. Three-day excursions to Kiev, Leningrad and Tbilisi, including visits to institutes engaged in research of interest to crystallographers, were further organized for the days before and after the Congress period.

Symposium on Crystal Growth

During the two days immediately following the Congress, a Symposium on Crystal Growth was held. This Symposium was opened on Wednesday morning 20 July by the Chairman of the Soviet Organizing Committee, B. K. VAINSHTEIN. After the Convener of the Symposium, N. N. SHEFTAL, had given an introductory talk, a report about the International Conference on Crystal Growth (Boston, Mass., 20-24 June 1966) was presented by R. PARKER. The following three invited lectures were then delivered at this plenary session:

'The dependence of crystal morphology on crystal growth' by P. HARTMAN;

'Croissance cristalline en présence d'une substance étrangère' by R. KERN; and

'Real structure, activity and long-range effects of crystalline surfaces' by G. I. DISTLER.

127 contributed papers, which had been arranged in four divisions running simultaneously, were presented on Wednesday afternoon 20 and Thursday 21 July. Abstracts of these papers were included in the volume of Collected Abstracts, copies of which had been distributed in advance, and the western-languages edition of which will be republished in *Acta Crystallographica*. It is intended that the full text of practically all the papers presented at the Symposium will be published in Russian.

Notes and News

Announcements and other items of crystallographic interest will be published under this heading at the discretion of the Editorial Board. The notes (in duplicate) should be sent to the General Secretary of the International Union of Crystallography (G. Boom, Laboratorium voor Technische Natuurkunde der Rijksuniversiteit, Westersingel 34, Groningen, The Netherlands). Publication of an item in a particular issue cannot be guaranteed unless the draft is received 8 weeks before the date of publication.

Charts for X-ray crystallography

A new series of charts for X-Ray crystallography, on durable plastic material, have been prepared by the Equipment Sub-Committee of the X-Ray Analysis Group of The Institute of Physics and The Physical Society and are now available at a cost of 10s per chart including postage:

- PC 2P Bernal chart for camera 6.00 cm diameter.
- PC 37P Bernal chart for camera 5.73 cm diameter.
- PC 31P Weissenberg chart with single set of curves at 180°.

PC 32P Weissenberg chart with two sets of curves at 90° (both Weissenberg charts are for cameras with 5.73 cm diameter and 2° rotation per mm travel).

PC 5P Orientation chart with ρ and ϕ curves on upper half of chart and θ curves on lower half.

PC 6P Laue chart, $\theta\phi$, for 6.00 cm camera.

Reprints of PC 33 (5 Bunn Charts) are also available in sets of five at 40s (including postage). These reprints are of considerably better quality than those available hitherto.

Orders for these charts may be made on application to the Finance Assistant, The Institute of Physics and The Physical Society, 47, Belgrave Square, London, S.W.1, England.