

## International Union of Crystallography

### Report of Executive Committee for 1966

#### Personal notes

In 1966 the crystallographic world lost two of its distinguished members. On 2 November, Prof. Pieter Debye died at the age of 82. His name is connected with many important notions in physics as well as in crystallography. In 1936 Prof. Debye received the Nobel prize for chemistry.

A few days later, on 6 November, Dr Arthur Lindo Patterson died at the age of 64. During the years 1933–36 he developed the theory of the  $|F|^2$  synthesis now known universally as the Patterson synthesis. Dr Patterson was a member of the Executive Committee during the period 1948–54.

Obituaries for both Prof. Debye and Dr Patterson were published in this journal (*Acta Cryst.* (1967) **22**, 947 and 749 respectively).

#### Meetings

The Seventh General Assembly of the Union was held in Moscow, U.S.S.R., from 12 to 19 July 1966, by invitation of the Academy of Sciences of the U.S.S.R. During the period of the General Assembly, the Seventh International Congress of Crystallography took place. It was attended by 1536 scientists and 297 accompanying members from the U.S.S.R., and 1086 scientists and 266 accompanying members from 33 other countries. The Congress was followed by a Symposium on Crystal Growth, on 20 and 21 July.

A summary report has been published in this journal (*Acta Cryst.* (1967) **22**, 606); a more detailed report of the proceedings of the General Assembly has been published separately, and was sent to the National Committees for Crystallography and to all persons participating in the work of the Union. A few copies are available from the General Secretary.

The General Assembly met on Tuesday afternoon 12 July, Friday evening 15 July and Tuesday afternoon 19 July. In addition to the routine business such as receipt and discussion of Commission reports, election of new Officers of the Executive Committee and of Chairmen and members of the (then) 10 Commissions, a number of important decisions were made.

1. Two new members were admitted to the Union, *viz.* the Polish Academy of Sciences [Polska Akademia Nauk] and the Yugoslav Academy of Science and Arts [Jugoslavenska Akademija Znanosti i Umjetnosti]. The Assembly further ratified the change in the joint membership of the German crystallographers through the Deutsche Mineralogische Gesellschaft into a membership with the Adhering Body to be formed by (a) the Sektion für Kristallkunde of this society which is seated in the Federal Republic of Germany and (b) the Deutsche Vereinigung für Kristallographie, seated in the German Democratic Republic. The two societies have formed a Regional Committee for Crystallography. The number of Adhering Bodies constituting the Union's membership is now thirty.
2. A Commission on Neutron Diffraction was established.

3. The Executive Committee was authorized to take further steps concerning the establishment of a Commission on Crystal Growth. In December 1966 the Executive Committee established this new Commission, bringing the total number of Commissions to 11.
4. The Executive Committee was also authorized to look further into the desirability of the establishment of a Commission on Crystallographic Studies at Pressures and Temperatures other than Normal. Inquiries on this subject have been started.
5. The General Assembly approved of the proposals of the Executive Committee to set up an Advisory Panel, a Publications Sub-Committee and a Sub-Committee on Statutes and By-Laws. The Advisory Panel was (a) to suggest ideas about the most suitable organization of the Eighth Congress to the Programme Committee for that Congress, and (b) to advise on future Congresses. The Publications Sub-Committee was to consider the publications policy of the Union, mainly with regard to the Union's journals. The Sub-Committee on Statutes and By-Laws was to scrutinize the present Statutes and By-Laws, to look into a number of proposals already made, and to make recommendations to the Executive Committee.
6. The General Assembly adopted a proposal of the Executive Committee that the Union should cooperate with UNESCO in a new Pilot Project on the Teaching of Crystallography in relation to the Physics and Chemistry of Solids, which would take place during the period 1967–70.
7. The unit contribution was increased from U.S. \$ 60 (at which level it had been effectively since 1951) to U.S. \$100.
8. The General Assembly accepted unanimously an invitation extended to the Union by the U.S. National Academy of Sciences, to hold the Eighth General Assembly and International Congress on the Stony Brook Campus of New York University, Long Island, U.S.A., during the second half of August 1969.

The scientific programme of the Congress consisted of (a) a Congress Discourse; (b) five General Lectures presented by invited speakers; and (c) about 770 contributed papers, arranged in 17 divisions, which were presented at eight to thirteen simultaneous morning and afternoon sessions. Contrary to the 1963 Congress in Rome, the Rapporteur system was not used, and the papers were presented by the authors themselves. At the Symposium, 4 invited and about 130 contributed papers were read.

During the period of the Congress and Symposium, an International Exhibition of Crystallographic Apparatus, Synthetic Crystals and Books was held, and an exhibition of photographs of crystallographic interest. Various social events took place.

#### Resignations and appointments

At the close of the Moscow General Assembly the terms of service of a number of Officers of the Union, and of Chairmen and members of Commissions, came to an end.

The Executive Committee wishes to take this opportunity to express the gratitude of the Union to all these persons for their participation in the Union's work. In particular, to Prof. P. P. Ewald, who served the Union in various offices on the Executive Committee since the establishment of the Union twenty years ago, and also as Editor of *Acta Crystallographica* from 1948, when the journal was established, to 1960; to Prof. J. M. Bijvoet, who served the Commission on *Structure Reports* for about 20 years; and to Dr D. W. Smits who resigned statutorily from the office of General Secretary after twelve years of service.

The new membership of the Executive Committee and of each of the Union's Commissions can be found in the summary report (*Acta Cryst.* (1967) **22**, 606).

### Publications

In addition to twelve regular monthly issues of *Acta Crystallographica* a supplementary part was published containing the abstracts of the papers presented at the Congress and Symposium.

Volume 23 of *Structure Reports*, covering the year 1959, was published in the beginning of the year.

A second edition of the *World List of Crystallographic Computer Programs* was published and was distributed to the subscribers to *Acta Crystallographica*.

### Adhering Bodies and National Committees

The latest list of the thirty Adhering Bodies of the Union and of the names and addresses of the Secretaries of National Committees is given in Table 1. The latest lists of memberships of the National Committees are included in the detailed Report of the Seventh General Assembly.

### Work of the Commissions

#### Commission on Acta Crystallographica

*Acta Crystallographica* has continued to increase in size, Volumes 20 and 21 between them amounting to 2273 pages. The increase is, however, rather less than in recent years, and Volume 21 includes 304 pages of abstracts of papers given at the Moscow Congress and Symposium. A survey of the contents of the last six years is given in Table 2.

The Commission met three times during the General Assembly in Moscow. In addition to its normal business, the Commission discussed proposed new journals of the Union. The Commission is unanimously of the opinion that there is a need for a journal in the field of applied crystallography, and is gratified that a suitable editor has been found for such a journal. It is of the opinion that the administration of the journals of the Union should be kept within a single commission, enlarged from the present Commission on *Acta Crystallographica*. This would ensure that papers could be routed to the most suitable journal without delay or loss of priority in the date of receipt. It would also make possible certain economies in production, particularly in the matter of technical editing.

From January 1967 onwards, Short Communications in *Acta Crystallographica* will be printed with an accompanying abstract.

#### Commission on Structure Reports

1966 has been a disappointing year since several Co-editors reported delays in preparing manuscripts because

of pressure of other work, and two Co-editors have given up in the middle of work on manuscripts. Volume 23 was published at the start of the year; Volumes 22 and 24 are suffering indefinite delays; progress on Volumes 26 and 27 and the Decennial Cumulative Index, Volume 25, has been good. The Inorganic Section is a constant source of worry because of the large number of papers (now exceeding one thousand) to be reported each year. A new format using much tabular presentation, which is to be introduced with Volume 28, may improve the situation.

#### Commission on International Tables

During a meeting held in Aachen, Germany, in January 1966 plans were discussed for a pilot edition of material for a future new edition of the *Tables*. The discussions were mainly on proposed Parts 1-4. Later in the year E. Hellner (Germany) joined the Commission. W. T. Holser (U.S.A.) resigned and his place was filled by V. A. Koptsik (U.S.S.R.).

Because of the complex interactions of the work it was decided to form an Editorial Committee comprising all those actively contributing rather than to have a number of small Committees, although there will be working groups.

The Commission met during the General Assembly in Moscow and at the Meeting of the International Mineralogical Association in Cambridge (U.K.).

Discussion on the various matters continued and it was decided to organize a meeting of the Commission and the Editorial Committee in Aachen in April 1967. At the meeting the production of Parts 1-4 of the pilot edition will be discussed, and Parts 5 and 6 will be studied. These six Parts are to form the projected Series A: *Symmetry Tables*. Future plans for Series B: *Diffraction Tables* will be considered also although it is not proposed to produce these in a pilot edition.

Reprints of the present Volumes II and III, with corrections only, are in preparation.

#### Commission on Crystallographic Apparatus

The Commission met several times during the period of the General Assembly in Moscow; the main activities were as follows:

1. *Bibliographies* (E. G. Steward). The third bibliography on 'Methods of obtaining Monochromatic X-rays and Neutrons' is completed and is being prepared for publication. The fourth bibliography on 'Novel Detectors' is in preparation. Supplements to the earlier bibliographies to bring them up to date are under consideration.
2. *Single Crystal Intensity Measurement on Diffractometers* (S. C. Abrahams). Data measured on D(+)-tartaric acid crystals by 16 participants were processed and the results summarized at an Open Session of the Commission during the Seventh General Assembly. A report for publication is in preparation. The results indicated that tartaric acid could not be regarded as an ideal material for a standard in this project and discussion has continued on an alternative material for the second phase of this project.
3. *Powder Intensity Project* (F. H. Herbststein). Discussion on this project at the Open Session of the Commission held in Moscow indicated sufficient interest to warrant its being initiated. It is planned to circulate samples of selected material for measurement, the samples to be supplied by B. W. Batterman, D. R. Chipman and L. D. Jennings.

Table 1. *Adhering Bodies*

Country	Group*	Adhering body	Secretary of National Committee
Argentina	I	Consejo Nacional de Investigaciones Científicas y Técnicas	MARÍA JIMÉNEZ DE ABELEDO, Laboratorio de Difracción, Comisión Nacional de Energía Atómica, Avenida del Libertador General San Martín 8250, Buenos Aires
Australia	III	Australian Academy of Science	J. DEEBLE, Australian Academy of Science, Gordon Street, Canberra City, A.C.T.
Austria	I	Österreichische Akademie der Wissenschaften	J. ZEMANN, Mineralogisches Institut der Universität, Dr Karl Lueger-Ring 1, 1010 Vienna
Belgium	II	Académie Royale des Sciences, des Lettres et des Beaux-Arts de Belgique	R. PANKOWSKI-FERN, Institut des Matériaux, U.L.B., 87 Avenue Adolphe Buyl, Brussels 5
Brazil	I	Conselho Nacional de Pesquisas	E. TAVORA, Faculdade Nacional de Filosofia, Av. Pres. Antonio Carlos 40, Rio de Janeiro, G.B.
Canada	III	National Research Council	F. R. AHMED, Division of Pure Physics, National Research Council, Ottawa 7, Ontario
Chile	I	National Committee for Crystallography	R. MUÑOZ, Instituto de Física y Matemática, Sección Cristalografía, Universidad de Chile, Casilla 2777, Santiago
Czechoslovakia	I	Československá Akademie Věd	A. LÍNEK, Institute of Solid State Physics, Československá Akademie Věd, Cukrovarnická 10, Prague 6
Denmark	I	Akademiet for de Tekniske Videnskaber	S. JORGO JENSEN, Aarhus Tandlægehøjskole, Vennelyst Boulevard, Aarhus C
Finland	I	Suomalainen Tiedekatemia	K. A. MANSIKKA, Wihuri Physical Laboratory, University of Turku, Vesilinnantie 5, Turku
France	IV	Académie des Sciences (Institut de France)	A. AUTHIER, Laboratoire de Minéralogie-Cristallographie à la Sorbonne, 1 Rue Victor-Cousin, Paris 5
Germany	V	Sektion für Kristallkunde of the Deutsche Mineralogische Gesellschaft (B.R.D.), jointly with the Deutsche Vereinigung für Kristallographie of the Deutsche Gesellschaft für Geologische Wissenschaften (D.D.R.)	Not yet settled, and provisionally as follows: (a) for the B.R.D.: R. BRILL, Fritz-Haber-Institut der Max-Planck-Gesellschaft, Faradayweg 4-6, 1 Berlin-Dahlem 33 (b) for the D.D.R.: H. NEELS, Institut für Mineralogie und Petrographie der Karl-Marx-Universität, Scharnhorststrasse 20, 703 Leipzig
Hungary	I	Magyar Tudományos Akadémia	L. ZSOLDOS, Department of Experimental Physics, L. Eötvös University, Muzeum krt. 6-8, Budapest VIII
India	I	Ministry of Scientific Research and Cultural Affairs	G. N. RAMACHANDRAN, Department of Physics, University of Madras, Alagappa Chettiar College of Technology Buildings, Guindy, Madras 25
Israel	I	Israel Crystallographic Society	ADA YONATH, The Weizmann Institute of Science, Department of X-ray Crystallography, P.O.B. 26, Rehovoth
Italy	III	Consiglio Nazionale delle Ricerche	M. FORNASERI, Istituto di Geochimica, Università di Roma, Città Universitaria, Rome
Japan	IV	Science Council of Japan	R. SADANAGA, Mineralogical Institute, Faculty of Science, University of Tokyo, Hongo, Tokyo
Netherlands	III	Stichting voor Fundamenteel Onderzoek der Materie met Röntgen- en Elektronenstralen	P. M. DE WOLFF, Laboratorium voor Technische Natuurkunde der T. H., Lorentzweg 1, Delft
New Zealand	I	The Royal Society of New Zealand	P. P. WILLIAMS, Chemistry Division, D.S.I.R., Wellington
Norway	I	Det Norske Videnskaps-Akademi	S. FURBERG, Kjemisk Institutt C, Universitetet i Oslo, Blindern, Oslo 3
Pakistan	I	Pakistan Council of Scientific and Industrial Research	M. M. QURASHI, Defence Science Organization, Government of Pakistan, Ministry of Defence, 21 Victoria Barracks, Rawalpindi
Poland	I	Polska Akademia Nauk	K. ŁUKASZEWICZ, Institute of Low Temperature and Structure Research, Polish Academy of Sciences, Wybrzeże Wyspiańskiego 27, Wrocław
South Africa	I	South African Council for Scientific and Industrial Research	G. GAFNER, National Physical Research Laboratory, P.O. Box 395, Pretoria
Spain	III	Consejo Superior de Investigaciones Científicas	S. GARCÍA-BLANCO, Instituto de Química Física 'Rocasolano', Consejo Superior de Investigaciones Científicas, Serrano 119, Madrid 6
Sweden	II	Kungliga Vetenskapsakademien	I. LINDQVIST, Department of Agricultural Chemistry I, Royal Agricultural College of Sweden, Uppsala 7
Switzerland	II	Société Suisse de Minéralogie et de Péetrographie	F. H. LAVES, Institut für Kristallographie und Petrographie der E.T.H., Sonneggstrasse 5, 8006 Zürich
U.K.	V	The Royal Society	D. C. MARTIN, The Royal Society, 6 Carlton House Terrace, London S.W.1
U.S.A.	V	National Academy of Sciences - National Research Council	J. A. IBERS, Department of Chemistry, Northwestern University, Evanston, Illinois 60201

Table 1 (cont.)

Country	Group*	Adhering Body	Secretary of National Committee
U.S.S.R.	V	Akademija Nauk S.S.S.R.	V. I. SIMONOV, Institute of Crystallography, Leninsky Prospekt 59, Moscow B-333
Yugoslavia	I	Jugoslavenska Akademija Znanosti i Umjetnosti	B. KAMENAR, Laboratory of General and Inorganic Chemistry, Faculty of Science, Ul. Soc. Revolucije 8, Zagreb

\* Adherence to the Union is in one of five Groups I-V, with corresponding voting powers and contributions as set out in Statutes 2.6, 4.5 and 8.4.

Table 2. Survey of the contents of Acta Crystallographica

Vol.	Year	Number of pages	Articles			Short Communications		
			Number	Number of pages	Average length	Number	Number of pages	Average length
14	1961	1318	206	1111	5.40	166	181	1.09
15	1962	1324	199	1170	5.88	105	106	1.01
16*	1963	1471*	198	1099	5.55	101	117	1.16
17	1964	1631	242	1406	5.81	127	162	1.28
18 & 19	1965	2172	330	1943	5.89	134	161	1.20
20 & 21†	1966	2273†	287	1751	6.10	118	159	1.35

\* Volume 16 includes the report of the Rome Congress, involving 198 pages of abstracts.

† Volume 21 includes 304 pages of abstracts of papers presented at the Moscow Congress.

4. *Index of Crystallographic Supplies* (V. Scatturin). A draft of the proposed contents of this third edition was circulated and discussed by the Commission. It was agreed that considerable additional material relating to certain regions was required.

5. *Inter-Congress Meeting on 'Accurate Determination of X-ray Intensities and Structure Factors'* (A. McL. Mathieson). The Commission was authorized to proceed with the organization of this meeting. Attendance will be by invitation and will be restricted to about 100. The location will be Churchill College, Cambridge (U.K.) and the dates 24-28 June 1968.

The Commission was involved in the Exhibition of Non-Commercial Apparatus (M. M. Umansky) and the Exhibition of Photographs (F. H. Herbstein). The latter exhibition was the first of its type at a Congress; the assistance of Dr N. V. Gliki in the preparation of this exhibition is gratefully acknowledged.

Three well-attended Open Sessions were held in Moscow: (a) Report and Discussion on the Single Crystal Project (S. C. Abrahams), (b) Discussion on a possible Powder Project (F. H. Herbstein), and (c) Novel Detectors for X-rays (U. W. Arndt).

#### Commission on Crystallographic Computing

The second edition of the *World List of Crystallographic Computer Programs*, edited by D. P. Shoemaker (U.S.A.), has been published. A total of 697 programs are included in the *List*.

The Commission organized an Open Session of seven lectures on computing on 20 July in conjunction with the Moscow Congress.

Substantial progress has been made towards evolving a set of standard test calculations with results. The tests are intended to assist in the checking of individual programs.

#### Commission on Crystallographic Data

During 1966 there was a marked increase in the field of crystallographic documentation with the establishment of computer-based structural libraries in the Universities of Pittsburgh (U.S.A.) and Cambridge (U.K.), and the projected Data Centre in Japan. The Commission continued to maintain liaison between the various organizations.

The U.S.S.R. National Data Committee prepared several hundred abstracts for *Crystal Data*. Publication of the next edition, which will be computer-produced, was held up because of programming difficulties. The third edition is expected to appear during 1967.

The Report on 'Primary Crystallographic Data' was completed and presented to the Executive Committee at the Moscow Congress.

During the Congress the Commission arranged an Open Session jointly with the Commissions on *Structure Reports* and *Acta Crystallographica* on present and future work on crystallographic data. A second Open Session on Powder Data was also held, which resulted in the establishment of a working party to prepare recommendations on the publication of powder data.

A small informal meeting of crystallographers actively engaged in documentation work was also arranged to discuss future activities and to minimize possible duplication of work.

#### Commission on Crystal Growth

This new Commission was established in December 1966. Its objects will be:

1. To consider and establish contacts with associations or national commissions concerned with work on the different kinds of crystal-growth studies;

2. To prepare periodically a list of studies carried out in the laboratories specializing in crystal growth, and to give information to laboratories working on the subject only occasionally;
3. To encourage and to take part in the production of monographs, textbooks and films for teaching on crystal growth, and to investigate existing means;
4. To participate in the organization and planning of symposia on crystal growth;
5. To cooperate with organizations like the International Conference on Crystal Growth and the International Mineralogical Association.

#### *Commission on Crystallographic Nomenclature*

The Commission met during the Moscow Congress and has also functioned by correspondence. The main matters discussed were symbols for molecular symmetry and for atomic coordinates expressed as actual distances. The Commission has recommended that a next edition of *International Tables* should contain a full exposition of the Hermann-Mauguin symbols for molecular (non-crystallographic) symmetry. The Commission Chairman has attended two meetings of the Commission on *International Tables* to discuss this and various other matters concerning nomenclature. The Commission has further recommended that the symbols for dimensional atomic coordinates be X, Y, Z, as has been the systematic practice in *Structure Reports* and a frequent practice in *Acta Crystallographica*. The Commission feels that other uses of these letters will not ordinarily lead to confusion.

#### *Commission on Crystallographic Teaching*

The main activities of the Commission are as follows:

1. A. J. Frueh (Canada) is planning to organize a Summer School in conjunction with the Eighth Congress to be held in the U.S.A. in 1969.
2. The first supplement to the *Crystallographic Book List* (H. D. Megaw) was sent to the printers and will be published in early 1967. C. A. Taylor will investigate the possibilities of continuing this activity.
3. J. M. Bijvoet, W. G. Burgers and H. G. Hägg will edit a monograph containing reproductions of papers on X-ray crystallography that are of historic interest. A first list of possible articles has been prepared (H. D. Megaw) and will be studied.
4. There are two fields of cooperation with UNESCO at present:
  - (a) The Commission will form a panel to cooperate with UNESCO in the new Pilot Project on the Teaching of Crystallography in relation to the Physics and Chemistry of Solids;
  - (b) Contracts have been signed between UNESCO and the Union for making teaching films. Dr A. L. Mackay (London) will make a film on 'Coordination polyhedra', and Prof. P. Chatelain (Montpellier) is planning a film on liquid crystals.

#### *Commission on Electron Diffraction*

During the Moscow Congress the Commission members discussed several subjects in the field of electron diffraction, such as design of new diffraction apparatus, counting systems, use of computers and high-temperature work.

Further discussions took place on the meeting planned to commemorate the 40th anniversary of the discovery of electron diffraction, to be held under co-sponsorship of the Union in July 1967, London, U.K.

#### *Commission on Neutron Diffraction*

This Commission was set up by the 7th General Assembly. No meetings have been held in 1966, but work is proceeding by correspondence on an up-to-date list of the coherent scattering amplitudes of elements and isotopes for neutrons.

#### **Representation on other Bodies**

##### *Abstracting Board of the International Council of Scientific Unions*

An observer attended the Full Board meetings held in Paris from 6 to 10 July.

Of the most interest to the Union were discussions of the surveys on Abstracting Periodicals in Physics and on Major Journals in Physics, since *Acta Crystallographica* was included among the latter. A full report of comparative costs and publication times for *Acta Crystallographica* is given in the summary report (*Acta Cryst.* (1967) **22**, 606).

A discussion of Chinese scientific literature revealed much work which was probably not covered by the abstracting services because of language difficulties and difficulties of obtaining regular supplies of periodicals. But even such a relatively simple problem as adopting a common system for transliteration of the titles of Chinese periodicals did not find any ready solution at the meeting and further work on the problem was planned.

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

The present membership of this Commission is: W. Dekeyser (Belgium), Chairman; W. Boas (Australia), Secretary; F. C. Frank (U.K.), L. P. Gorkov (U.S.S.R.), T. Nagamiya (Japan), A. Seeger (Germany), E. F. Bertaut (France), and B. E. Warren (U.S.A.), ordinary members (the last two nominated by the International Union of Crystallography); E. Chiarotti (Italy), A. Guinier (France), J. S. Koehler (U.S.A.), W. T. Merz (Switzerland), J. W. Rathenau (Netherlands), and G. Szigetti (Hungary), corresponding members.

The Commission has approved of requests for sponsorship by IUPAP of the first two of the following four proposed conferences: (a) 'Luminescence' (Zürich, 1969); (b) 'Vacancies and Interstitial Atoms' (Jülich, Germany, September 1968); (c) 'Colour Centres' (Rome, September 1968); (d) 'Fracture' (Brighton, U.K., April 1969).

Again, crystallographers are invited to propose to the Commission topics of mutual interest for joint conferences of IUCr and IUPAP. The addresses of the Union's representatives are given in the summary report (*Acta Cryst.* (1967) **22**, 606).

##### *Inter-Union Commission on Science Teaching of the International Council of Scientific Unions*

The Commission has been active in organizing a Congress on the Integration of Science Teaching to be held in September 1968 in Bulgaria. The representatives of the Union have been invited to present a report on the status of crystallography in the field of teaching, although the Congress will be mainly concerned with teaching at the secondary and lower University level.

#### **International Council of Scientific Unions**

The Union was represented at the 5th Executive Committee meeting and the 11th General Assembly of ICSU (Bombay,

January 1966) by the (then) General Secretary, Dr D.W. Smits. A main point of interest to the Union was the establishment of an ICSU Committee on Data for Science and Technology. The Union is represented on this Committee by the Chairman of the Commission on Crystallographic Data.

The representative of the Union at the 6th meeting of the ICSU Executive Committee held in Monaco on 7-8 October was the President, Prof. N.V. Belov. Most of the discussions were not of direct interest to the Union. Reports were given of the Unions and of the Commissions, Committees and Permanent Services. New Statutes were adopted for, amongst others, the Committee on Data for Science and Technology.

The 12th General Assembly of ICSU will be held in Paris, from 24 to 29 June 1968. The 7th meeting of the ICSU Executive Committee will take place in Rome, Italy, 9-10 October 1967.

### Finances

The audited accounts of the Union for the year 1966 are given at the end of this Report. The appointments of a new Treasurer and new Auditors have provided the opportunity for some alterations in the manner of presentation of the accounts. The amounts are now expressed in U.S. dollars since dollars are used both to specify the unit contributions from the Adhering Bodies and in ICSU and UNESCO accounts. For ease of comparison, the 1965 figures are provided in italics. Negative quantities are indicated by parentheses. The standard rates of exchange used by U.N. organizations in 1966 have been applied in currency conversions. The only alterations from the 1965 rates have been slight changes in the values of the Netherlands guilder, and the Swedish crown. The small gain on revaluation has been added to the balance of the General Fund Account.

The *Acta Crystallographica* account for 1966 shows a profit of \$9,585, which is a welcome improvement from the deficit of \$22,998 suffered in 1965 and is primarily due to the increase in the basic annual subscription from D.Kr. 240 to D.Kr. 400. Nevertheless the excess of income is small in relation to the expenditure of \$110,796 and to the fact that even now the accumulated balance of \$27,363 in the *Acta* account would pay for the costs of only three months working. This is an insufficient reserve for a publishing enterprise on the scale of *Acta*. Printing costs increase erratically by amounts of 3-8% per year, and these are only partly offset by the increase in the number of subscribers (from 1,893 in 1960 to 2,356 in 1966). However, the perpetual danger to the financial stability of *Acta* arises from the literary fecundity of crystallographers, which has sent up the number of pages printed from 1,164 in 1960 to 2,273 in 1966 - a 12% annual growth.

The net income from advertisements in *Acta* of \$6,759 is the highest yet. On the other hand editorial expenses have risen; the Technical Editor has had now to rent an office and to employ a full-time typist. The sale of back numbers (\$17,113 gross) has continued to rise, and this income has more than offset the expenditure on the reprinting of Volume 10, stocks of which were exhausted.

For *Structure Reports* income exceeded expenditure by \$7,986 in 1966. Volume 23 covering 1959 was published during the year, and sales of earlier volumes continued at a satisfactory level. The accumulated balance of \$62,785 is sufficient to meet foreseeable editorial and printing expenses for the several volumes now being prepared.

The state of the *International Tables* account is also satisfactory. Volume 1 has been reprinted and sales of all three volumes have continued steadily to give an excess of income over expenditure of \$2,671. The increase in editorial expenses is a reflexion of the long-term preparations now beginning for revised new editions.

In 1966 \$612 were received from the sales of 75 copies of *Fifty Years of X-ray Diffraction* and the accumulated deficit in the account decreased to \$1,026. The sales of *Symmetry Aspects of M.C. Escher's Periodic Drawings* were excellent and 996 copies were sold with an income of \$4,206, thus reducing the deficit on this account to \$3,271. The deficits on both accounts are expected to have been recovered from sales by 1968 or 1969.

The accumulated balance of the General Publications Fund remained unaltered at \$49,560 in 1966.

The largest charges against the General Fund in 1966 were in connexion with the Seventh General Assembly and International Congress in Moscow, and as anticipated these have led to an excess of expenditure over income. The balance in the General Fund has thus decreased by \$11,148 to \$13,951. The balance is adequate since there will be no expense for major meetings in 1967 and future income from the Adhering Bodies will be larger by \$5,400 owing to the change of the unit of subscription from \$60 to \$100.

The travel grants for the Moscow meeting, \$9,198, were rather lower than for the Rome meeting in 1963, but the expenses for Abstracts, \$15,146, were vastly greater, both because of the larger size of the booklet and because two separate editions were prepared in Russian and Western languages.

The printing and distribution of the Second Edition of the *World List of Crystallographic Computer Programs* cost \$1,060. The Commission on Crystallographic Teaching organized a Summer School at Harmonia, Czechoslovakia in July and this was supported by a subvention of \$1,000 from UNESCO which was used for travel grants to lecturers.

The subvention to the Union received from UNESCO through ICSU remained constant at \$5,250. The subscriptions from Adhering Bodies amounted to \$7,920, and the interest from investments and deposit accounts decreased slightly from \$6,620 in 1965 to \$6,547.

In 1966 the holding of investments decreased by the redemption of *f.*2,000 3% Nederland 1937, \$4,500 3% Nederland 1947, *f.*6,000 4½% Nederland 1964, and *f.*19,000 3% Nederlandsch Indië 1937. There was a profit on these redemptions of \$506. As on previous Balance Sheets the investments have been valued according to their quotations at the end of the year. Their depreciation in value, together amounting to \$2,065, has not been charged against the General Fund, but has again been included as an asset on the Balance Sheet to avoid annual fluctuations in value influencing the General Fund Account.

The larger parts of the balances with the banks are still placed on deposit accounts, namely, at the end of 1966, *f.*110,000 with the Amsterdam-Rotterdam Bank N.V., \$20,187 with the First National City Bank, Sw.Kr. 56,916 with A.B. Svenska Handelsbanken, and £6,189 with the Westminster Bank Limited. The amounts shown on the Balance Sheet for Debtors and Creditors relate to sums, principally on the publishing accounts, due at 31 December 1966. Where appropriate, these amounts have since been settled.

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## International Union of Crystallography

## Balance Sheet as at 31 December 1966

	U.S. Dollars		U.S. Dollars	
	1966	1965	1966	1965
<b>FOUND ACCOUNTS</b>				
As at 31 December 1965				
Profit on Revaluation of Currency		Excess of Income over Expenditure for the Year		
17,778.11	9,585.16	27,363.27	17,778.11	
54,799.59	7,985.67	62,785.26	54,799.59	
31,176.73	2,671.06	33,847.79	31,176.73	
49,559.85	—	49,559.85	49,559.85	
(1,637.42)	—	611.88	(1,637.42)	
(7,476.51)	—	4,205.98	(7,476.51)	
24,759.89	338.83	(11,148.14)	13,950.58	24,759.89
<u>\$ 168,960.24</u>	<u>338.83</u>	<u>13,911.61</u>	<u>183,210.68</u>	<u>168,960.24</u>
<b>CURRENT ASSETS</b>				
Cash at Banks	11,196.08		8,931.73	
Current Accounts				
Deposits and Savings Accounts	79,235.69	90,431.77	76,961.59	85,893.32
Cash with Union Officials		1,035.79		795.80
Debitors		34,759.59		20,570.55
Subscriptions from Adhering Bodies				
Due for 1966	480.00		420.00	
Less Paid in advance	120.00	360.00	120.00	300.00
	<u>126,587.15</u>		<u>107,559.67</u>	
Deduct Creditors		12,850.26		19,190.54
<i>Net Current Assets</i>	<u>113,736.89</u>		<u>88,369.13</u>	
<b>FIXED ASSETS</b>				
Investments at market value on 31 December 1966	65,803.42		76,097.90	
Add Interest accrued thereon	965.64		1,104.66	
Depreciation in value of Investments entered as an asset	<u>2,064.73</u>		<u>3,142.69</u>	
Office Equipment at cost less depreciation	68,833.79		80,345.25	
	640.00		245.86	
<i>Total Fixed Assets</i>	<u>69,473.79</u>		<u>80,591.11</u>	
	<u>\$ 183,210.68</u>		<u>\$ 168,960.24</u>	

## Notes

- Rates of Exchange**  
The standard rates of exchange, as per details issued by the ICSU Secretariat in 1966, have been adopted in these accounts. These are as follows, compared with the U.S. dollar.

	1966	1965
French Francs	4.90	4.90
Netherlands Guilders	3.60	3.62
Swedish Crowns	5.16	5.17
Danish Crowns	6.907	6.907
Pounds Sterling	0.3571	0.3571
- Investments**  
The depreciation in the value of Investments has been shown in the Balance Sheet only. This is to prevent fluctuation in their value from affecting the result of the General Fund.
- Stocks of unsold copies of Union publications**  
As previously the value of these stocks has not been taken into account for Balance Sheet purposes.

## General Fund Account for the year ended 31 December 1966

	U.S. Dollars		U.S. Dollars	
	1966	1965	1966	1965
Subscription to ICSU (2% of subscriptions received from Adhering Bodies in 1965)		152.30		5,250.00
Subscription to ICSU Inter Union Commission on Scientific Teaching Administration Expenses:		200.00		14,000.00
Honoraria General Secretary, Treasurer and Secretarial Assistance	3,112.24	2,476.19	1,000.00	—
Audit and Accountancy Charges	949.70	431.48	7,920.00	7,491.43
Postages, Stationery, Printing and Sundries	1,067.14	407.30	2,582.03	2,668.29
Bank Charges and Differences on Exchange	83.74		3,965.01	3,951.22
Depreciation of Office Equipment	36.90	16.57	505.58	85.77
Seventh General Assembly and International Congress Moscow, USSR	9,197.57	4,100.48	4,873.62	4,019.60
Travel Expenses and Travel Grants	15,146.45		291.93	854.02
Printing and Distribution of Collected Abstracts	107.42		209.17	209.17
Miscellaneous Expenses	83.47		41.83	41.83
Printing of Report		4,100.48	79.47	167.34
Incidental Travelling Expenses		514.65	79.47	1,038.24
International Conference in Melbourne, Australia: Travel Grants to Participants			—	1,205.58
Cost of Printing and Distributing <i>World List of Crystallographic Computer Programs</i>		31,421.60	165.36	130.03
<i>World Directory of Crystallographers</i> , 3rd Edition	1,059.74		33.07	23.93
Commission on Crystallographic Teaching		5,096.43	132.29	106.10
Travel Grants	1,000.00		132.29	1,006.00
Initial payment re 'Coordination Polyhedra' films	200.00		—	16.68
Printing and Distributing Bibliographies		3,186.59	—	—
<i>Crystallographic Book List</i>		2,044.96	200.00	—
Expenses of Commission on Crystallographic Data		81.76	11,148.14	10,452.84
	<u>\$ 33,074.45</u>	<u>\$ 50,253.51</u>	<u>\$ 33,074.45</u>	<u>\$ 50,253.51</u>



**Escher Drawings Account for the year ended 31 December 1966**

	U.S. Dollars	
	1966	1965
Publication Expenses:		
Cost of Printing and Binding		
Excess of Income over Expenditure carried to Balance sheet	4,205.98	8,884.53
	<u>4,205.98</u>	<u>8,884.53</u>
Sales of Copies		
Less Publishers' Commission on Sales		
Royalties		
Excess of Expenditure over Income carried to Balance Sheet		
	<u>4,205.98</u>	<u>8,884.53</u>
	1966	1965
	5,517.48	1,843.42
	965.67	322.60
	345.83	112.80
	4,205.98	435.40
	<u>4,205.98</u>	<u>1,408.02</u>
		<u>7,476.51</u>
	<u>\$ 4,205.98</u>	<u>\$ 8,884.53</u>

**Acta Crystallographica Account for the year ended 31 December 1966**

Publication Expenses:			
Printing and Binding Volumes 20 and 21 (18 and 19) (D.Kr. 499,704.69)	72,347.59	74,041.74	112,740.44
Distribution and Postage (D.Kr. 86,952.40)	12,589.02	11,603.24	17,113.08
	84,936.61	85,644.98	129,853.52
Less Net Reduction in charge of earlier volumes (D.Kr. 6,365.84)	921.66	—	16,231.69
	84,014.95	85,644.98	8,078.38
Printing and Distributing Supplement to Volume 21 Part 7 (f. 17,503.30)	4,862.03	—	5,679.55
Reprinting Volume 10	5,519.38	94,396.36	1,319.35
Editorial Expenses:			
Editorial Honoraria and Salaries	12,797.88	11,930.66	10,111.41
Secretarial Assistance, Postages, Telephone, Office Supplies, Stationery and Sundries	1,733.71	1,194.19	875.60
Travelling Expenses	1,163.96	239.34	—
Rent of Technical Editor's Office	560.00	—	—
Depreciation of Office Equipment	143.79	55.25	—
	16,399.34	13,419.44	16,231.69
Less Sale of Journals	—	16,399.34	8,078.38
Excess of Income over Expenditure carried to Balance Sheet	9,585.16	(22,997.63)	1,319.35
	<u>\$ 120,380.86</u>	<u>\$ 75,583.79</u>	<u>\$ 120,380.86</u>
			<u>\$ 8,803.95</u>

**Structure Reports Account for the year ended 31 December 1966**

	U.S. Dollars	
	1966	1965
Publication Expenses:		
Binding additional copies of		
Volume 18	307.69	—
Binding additional copies of		
Volumes 10, 13 and 16	—	742.29
Printing and Binding copies		
of Volume 23	10,897.21	11,204.90
	—	742.29
	10,897.21	11,204.90
Less Publishers' Commission	5,538.31	24,662.49
on Sales	—	5,628.60
	—	25,003.58
	5,538.31	24,662.49
Editorial Expenses:		
Editorial Honoraria, Abstractors'		
and Assistants' Salaries	5,445.45	5,951.77
Office and Travelling Expenses	26.47	370.29
	5,471.92	6,322.06
Excess of Income over Expenditure		
carried to Balance Sheet	7,985.67	17,939.23
	—	25,003.58
	7,985.67	17,939.23
	\$ 24,662.49	\$ 25,003.58

**International Tables Account for the year ended 31 December 1966**

	U.S. Dollars	
	1966	1965
Publication Expenses:		
Printing and Binding Reprint of		
Volume 1	8,489.71	—
Binding additional copies of		
Volumes 2 and 3	341.32	1,138.88
	8,831.03	1,138.88
Editorial Expenses:		
Editorial Office Expenses	98.00	184.80
Travelling Expenses	870.00	446.36
Cost of Trial Kit	—	148.40
Aachen Meeting	874.87	—
Expenses re Pilot Edition	128.22	779.56
	2,671.06	6,546.83
Excess of Income over Expenditure		
carried to Balance Sheet	\$ 13,473.18	\$ 8,465.27

**Fifty Years of X-ray Diffraction Account for the year ended 31 December 1966**

	U.S. Dollars	
	1966	1965
Excess of Income over Expenditure		
carried to Balance Sheet	741.67	1,033.15
	—	852.35
	741.67	1,033.15
	\$ 13,473.18	\$ 8,465.27

We report that we have examined the above Accounts together with the books and documents maintained by the Treasurer.

The books and documents for the period from 1 January 1966 to 10 September 1966 were kept by Dr D.W.Smits in Groningen, Netherlands and a summary of the transactions for the period to that date, as audited by Van Dien, Van Uden, Accountants, of Groningen, Netherlands, has been included in these Accounts. We have received all the information and explanations which we considered necessary for the purposes of our audit. In our opinion the Balance Sheet shows a true and fair view of the state of the affairs of The Union as at 31 December 1966 and the Income and Expenditure Accounts show a true and fair view of the excess of Income over Expenditure (General Fund - Expenditure over Income) for the year ended on that date.

Manchester 2, England

12 October, 1967

Signed: LITTON, POWNALL, BLAKEY & HIGSON

Chartered Accountants