

International Union of Crystallography

Report of the Executive Committee for 1990

Fifteenth International Congress and General Assembly

The Fifteenth General Assembly and International Congress of Crystallography were held on the campus of the three Universities of Bordeaux, France, 19-28 July 1990, by invitation of the Association Française de Cristallographie and the French Academy of Sciences. A report, including a detailed report of the General Assembly, will be published in *Acta Crystallographica* Section A.

The General Assembly and Congress were attended by 1852 scientists from 46 countries, together with 249 accompanying persons. The Second Ewald Medal and Prize were presented to Professor B. K. Vainshtein at the Opening Ceremony. There were 20 Main Lectures and 52 Microsymposia and Open Commission Meetings. The afternoons were reserved for poster sessions, with discussion sessions in the late afternoons to discuss the results presented in the posters and to extend the discussions on the Microsymposia. The 1600 abstracts received were all typeset and the figures scanned so that the published book of Collected Abstracts was prepared entirely by computer. These abstracts also appeared as a Supplement to *Acta Crystallographica*, Volume A46, dated 1 July 1990. Exhibitions of commercial crystallographic equipment, microcomputers and books were held in the poster session area and there was an exhibition of historical crystallography in France.

The General Assembly met on the evenings of Friday 20 July, Saturday 21 July and Wednesday 25 July. The minutes of the Fourteenth General Assembly in 1987 and the Extraordinary General Assembly on 19 December 1989 were approved. It received the triennial financial report and the reports of the Executive Committee, the Commissions, the Scientific Associates and Regional Associates and the Union Representatives on other bodies since the Fourteenth General Assembly in 1987. New Officers of the Union, Chairmen and members of Commissions and Union Representatives were elected; the full list of these people will be given as an Annex to the report of the Fifteenth General Assembly and Congress. A Commission on Synchrotron Radiation was established. It was agreed to continue efforts to form a Commission to cover the fields of modulated structures, polytypes and quasi-crystals. The report of the Working Party on Crystallographic Information was debated and accepted and the Working Party was disbanded. The good progress of the IUCr/Oxford University Press Book Series was reported. The American Crystallographic Association (ACA) was accepted as a Regional Associate. The Assembly continued the unit contribution unchanged for the years 1991-1993 inclusive at SwFr 890. It reaffirmed its decision to hold the Sixteenth General Assembly and Congress in Beijing, China. The dates have been changed slightly to 21-29 August 1993. It also provisionally accepted an invitation from the US National Committee for Crystallography to hold the Seventeenth General Assembly and Congress in the USA in 1996. The location and dates would be determined in 1991.

The Executive Committee met for several days before, and most days during, the Congress, mainly to deal with

matters directly related to the business of the General Assembly and the work of the Commissions.

Other meetings

In conjunction with the Congress mentioned above, the Union sponsored several satellite meetings in France, namely: Symposium on Short Range Order in Ill-Ordered Materials, Orsay, near Paris, 16-18 July; Symposium on Powder Diffraction, Toulouse, 16-19 July; Symposium on Complementary Applications of Diffraction by Neutrons and by X-ray Synchrotron Radiation, Alpe d'Huez, near Grenoble, 29-31 July; Symposium on Symmetry in Physical Space and in Superspaces. Physical Applications: Quasicrystals, Incommensurate Phases, Châtenay-Malabry, near Paris, 29-31 July; International School on Crystallographic Computing, Strasbourg, 29 July-5 August.

Other meetings held in 1990 and sponsored by the Union were: Winter School on Crystallography of Natural Materials for Science and Industry, Bangkok, Thailand, 7-15 February; First International Conference on Epitaxial Crystal Growth, Budapest, Hungary, 1-7 April; International School on Crystal Growth and Crystallographic Assessment of Industrial Materials, Sitges, Barcelona, Spain, 13-25 May; Summer School for Beginners with the Rietveld Method, Cieszyn, Poland, 9-11 August; XI Iberoamerican Congress on Crystallography (and associated Iberoamerican School on Crystallography), Mérida-Mérida, Venezuela, 9-14 September (and 2-8 September); Symposium on Computational Methods in Chemical Design. Molecular Modelling - Theory and Experiment, Schloss Elmau, near Garmisch-Partenkirchen, Germany, 15-20 October; International Symposium on Crystallography and Molecular Biology, Sao Paulo, Brazil, 5-9 November.

Executive Committee

The membership of the Executive Committee, including new members elected at the General Assembly in 1990, is as follows:

President: Professor A. Authier (France); Vice-President: Professor A. Kálmán (Hungary); General Secretary and Treasurer: Professor A. I. Hordvik (Norway); Immediate Past President: Professor M. Nardelli (Italy); Ordinary Members: Dr R. Chidambaram (India), Dr P. W. Coddington (Canada), Professor P. Coppens (USA), Dr R. Diamond (UK), Professor J. Harada (Japan), Dr Y. T. Struchkov (USSR).

Publications

Volume 46 of *Acta Crystallographica* and Volume 23 of the *Journal of Applied Crystallography* were published, as were Volume 55A of *Structure Reports* and the *Historical Atlas of Crystallography* edited by J. Lima-de-Faria.

Adhering Bodies

A list of Adhering Bodies of the IUCr was published in the report of the Executive Committee for 1988 [*Acta Cryst.*

Table 1. *Survey of the contents of the Union journals*

<i>Acta Crystallographica</i>													
Vol.	Year	Number of Pages*	Number of Papers	Full Articles		Short Format Papers		Short Communications		Fast Communications		Number	Average length
				Number	Average length	Number	Average length	Number	Average length	Number	Average length		
A42 } B42 } C42 }	1986	588 } 640 } 1892 }	98 } 90 } 732 }	85 } 89 } 648 }	174 } 6.3 } 6.7 }	— } — } 75 }	— } — } 1.6 }	13 } 1 } 9 }	23 } 1.1 } 0.9 }	— } — } — }	— } — } — }	— } — } — }	— }
A43† } B43 } C13 }	1987	840 } 584 } 2472 }	128 } 100 } 995 }	114 } 91 } 817 }	205 } 6.5 } 6.4 }	— } — } 174 }	— } — } 1.7 }	14 } 9 } 4 }	27 } 1.3 } 0.9 }	— } — } — }	— } — } — }	— } — } — }	— }
A44 } B44 } C44 }	1988	1104 } 680 } 2240 }	159 } 104 } 897 }	150 } 100 } 712 }	250 } 6.3 } 6.4 }	— } — } 174 }	— } — } 1.5 }	9 } 4 } 11 }	24 } 1.1 } 0.3 }	— } — } — }	— } — } — }	— } — } — }	— }
A45 } B45 } C45 }	1989	920 } 600 } 2030 }	143 } 94 } 806 }	122 } 90 } 550 }	212 } 6.6 } 6.6 }	— } — } 239 }	— } — } 1.9 }	14 } 4 } 17 }	35 } 0.9 } 0.5 }	— } — } — }	— } — } — }	7 } — } — }	3.4 }
A46‡ } B46 } C46 }	1990	998 } 864 } 2500 }	150 } 123 } 980 }	126 } 120 } 693 }	246 } 7.0 } 6.9 }	— } — } 270 }	— } — } 1.8 }	19 } 3 } 17 }	39 } 1.2 } 0.8 }	— } — } — }	— } — } — }	5 } — } — }	2.4 }
<i>Journal of Applied Crystallography</i>													
Vol.	Year	Number of Pages*	Number of Papers	Full Articles		Short Communications		Crystal Data ('86-'89) Fast Communications ('90)		Computer Programs		Short Items§	
				Number	Average length	Number	Average length	Number	Average length	Number	Average length	Number	Average length
19	1986	492	104	71	6.1	12	1.6	10	0.4	7	1.9	8	0.8
20	1987	538	105	70	5.7	12	2.0	4	0.5	15	3.1	4	0.6
21¶	1988	996	169	139	5.7	6	1.5	1	0.4	10	2.7	13	0.6
22	1989	642	125	81	6.7	18	1.6	—	—	12	4.3	6	0.7
23	1990	560	105	72	5.6	13	1.7	1	2.0	11	2.3	9	0.8

* Excluding indexes.

† Volume A43 includes, in addition, 360 pages of abstracts communicated to the Perth Congress.

‡ Volume A46 includes, in addition, 540 pages of abstracts communicated to the Bordeaux Congress.

§ Excluding Union Announcements, Crystallographers, New Commercial Products and Book Reviews.

¶ Volume 21 includes 303 pages of 43 papers presented at the International Conference on Applications and Techniques of Small-Angle Scattering, Argonne, 1987.

(1989). A45, 740–741]. An updated list will be published in *Acta Crystallographica* Section A in due course, in the Report of the Bordeaux General Assembly.

Work of the Commissions

Commission on Journals

Volume 46 of *Acta Crystallographica* (*Acta*) was published in 1990, and included a total of 1253 papers (a 20% increase from 1989) received from 48 countries, and an overall total of 4362 pages (a 23% increase from last year).

The average length of full articles in *Acta A* and *Acta B* increased to 6.9 pages in 1990 from 6.6 pages in 1989. Median publication times for these full articles, the average elapsed time between the published acceptance and nominal publication dates, were 4.6 months for *Acta A*, 5.2 months for *Acta B* and 8.6 months for *Acta C*. Corresponding publication times in 1989 were 4.8, 4.7 and 6.1 months, respectively. The unusually high publication time of 8.6 months for *Acta C* papers in 1990 is a temporary

event and a more usual publication time should be restored by the end of 1991. Median publication times in 1990 for Short Communications were 3.9 months for *Acta A*, 4.6 months for *Acta B* and 5.3 months for *Acta C*. The median publication times for Fast Communications papers in *Acta A* were 3.5 months and for Short Format papers in *Acta C* 5.3 months.

A total of 47 inorganic, 13 organometallic, 46 organic and 17 biological macromolecular papers appeared in Section B in 1990 compared with 36, 8, 41 and 4, respectively, in 1989. The distribution of papers in Section C was 128 inorganic, 294 organometallic and 557 organic in 1990, compared with 95 inorganic, 228 organometallic and 483 organic articles in 1989.

Volume 23 of the *Journal of Applied Crystallography* (*JAC*) was published in 1990. A total of 105 papers was published (a 16% decrease from 1989), received from 28 countries. Overall, the number of pages decreased to 560 in 1990 from 642 in 1989.

The average length of full articles in *JAC* was 5.6 pages in 1990, compared to 6.7 pages in 1989. The median publica-

tion time for full articles was 5.0 months for *JAC*, down from 5.4 months in 1989. The average page length for Short Communications and Computer Programs was 2.0 pages in 1990, compared to 2.6 pages in 1989. The median publication time for Short Communications and Computer Programs was 6.2 months in 1990, up from 4.5 months in 1989.

Several new initiatives were approved at the meeting in Bordeaux. *Acta A* will be published bimonthly and Sections A and B of *Acta* and *JAC* will accept Fast Communications. The handling in the future of *Acta C* papers will be centralized in Chester, with manuscripts being sent to the Technical Editor for checking before being transferred to the Co-editors. With additional editorial staff and computer facilities now being installed in Chester, it will soon be possible to submit most Section C papers in machine-readable format, either by E-mail or by diskettes mailed to Chester. The Commission will also investigate the feasibility of initiating a new journal or a new *Acta* section covering biological crystallography, and a Working Party has been established to make further recommendations to the Executive Committee regarding this new initiative.

Frank Allen, James Trotter and Terry Willis retired as *Acta* Co-editors, although Frank Allen remains an *ex officio* member of the Commission. Michel Schlenker retired as Editor of *JAC* and was succeeded by Mike Glazer.

David Brown, Penny Coddling, Syd Hall, John Helliwell, Alajos Kálmán, Masaaki Ohmasa and John Spence were appointed Co-editors of *Acta Cryst.* and C. J. Howard and Ian Langford were appointed Co-editors of *JAC*. Gernot Kostorz, a former *JAC* Co-Editor, was appointed as Guest Editor for *JAC* to direct the acceptance of papers from the VIII International Meeting on Small-Angle Scattering in Leuven, Belgium, August 1990.

Commission on Structure Reports

Volume 55A (Metals and Inorganic Compounds for 1988) was published in 1990 and Volume 56A (Metals and Inorganic Compounds for 1989) was sent to the printer in 1990 (and was published in March 1991). Co-editorial work is almost complete on Volumes 50B and 51B (Organic Compounds for 1983 and 1984 respectively) and is continuing for the final volume of the series, Volume 52B (Organic Compounds for 1985).

Commission on International Tables

During the XV IUCr Congress the Commission met in both closed and open sessions. The status of the current volumes was reported and proposals for future volumes were outlined. The Open Meeting was well attended, but only the Editors and one *ex officio* member (out of seven) was able to attend the closed meeting.

Discussion continued on two other proposals (*Crystallographic Computing*; *Mathematics for Modern Crystallography*). Such volumes would be of great value to the crystallographic community, but the appropriate format needs further consideration. They might be volumes in the *International Tables* series or monographs, such as those in the IUCr/OUP Book Series. No decision has been reached and no prospective editors have emerged.

Volume A (*Space-Group Symmetry*; Editor Th. Hahn)

The third revised edition of Volume A is scheduled for 1992. During 1990 work on this volume continued in two directions, new space-group diagrams and subgroup data.

Volume B (*Reciprocal Space*; Editor U. Shmueli)

The present edition of Volume B covers various aspects of reciprocal space that occur in crystallographic theory and practice. As of January 1991, the corrected galley proofs of 18 of the 19 chapters had been received. The final draft of the outstanding chapter was received in May 1990. The Editor's activities during 1990 were largely devoted to the completion of the editing, correction of proofs and participation in the Commission meetings at Bordeaux.

Volume C (*Mathematical, Physical and Chemical Tables*; Editor A. J. C. Wilson)

As its meeting in 1989 the Executive Committee instructed the Editors of Volumes B and C to close their volumes at the end of 1989 and transmit to the Technical Editor only the material in their hands at that time. In fact, two contributions from eastern Europe that had been delayed until January 1990 were accepted. As of January 1991 the first eight parts are in page proof.

Volume D (*Physical Properties of Crystals*; Editor A. Authier)

The previous Editor of Volume D, B. T. M. Willis, resigned in March 1990. In July the Executive Committee asked A. Authier to take over the editorship. Only the initial section, *Mathematical introduction to tensorial properties and elasticity*, had been written. The new Editor has started consultations in order to redefine the contents of the proposed volume and to suggest potential authors.

Volume E (*Subperiodic Symmetry Groups*; Editors V. Kopsky and D. B. Litvin)

The Editors prepared a detailed plan for a volume on *Subperiodic Symmetry Groups*, consisting of three parts: Part 1. *Frieze-, rod- and layer-group types*; Part 2. *Relationships between subperiodic groups and space groups and among subperiodic groups*; and Part 3. *Symmetries of planes in crystals*. The plan was approved by the Commission and the Executive Committee in Bordeaux and work is in progress.

Volume 'F' (*Multidimensional Crystallography*; no Editor appointed)

The Chairman of the Commission and others within the IUCr have studied the practicability of preparing one or more volumes on multidimensional crystallography. The quantity of material makes it difficult to plan even a volume on four-dimensional crystallography and it is not entirely clear whether the theory is complete for higher dimensions. No decision on a volume of *International Tables* was reached, but collaboration with the Commission on Crystallographic Nomenclature has been established (see the report of that Commission). A small Working Group (T. Janssen, D. Weigel, H. Wondratschek, A. J. C. Wilson) is preparing recommendations on the nomenclature of crystal families, systems and Bravais lattices in four dimensions.

Commission on Biological Macromolecules

The last year has seen continued activity and achievement in macromolecular X-ray analysis. It is estimated that 100 plus crystal structures have been determined during 1990. This reflects partly the expansion in the field but also the advances in protein science and in crystallographic and

computing technologies. These developments make more urgent the issues of data deposition and publication of structures. The arrangements agreed to for data deposition appear to be largely satisfactory and have been greatly welcomed outside the immediate crystallographic community. There are several new journals appearing, or about to appear, which will publish macromolecular structures and science. The community has no special loyalties but many consider that *Acta Crystallographica* in some form or other could play a useful rôle in publishing macromolecular structures.

The XV IUCr Congress was very successful; the large proportion of biologically interesting sessions, the importance of the structures presented and the discussions on methods, technology and synchrotron techniques gave the macromolecular crystallographers a splendid diet. The Congress provided an opportunity for Commission members to meet the community and, in particular, to discuss how to define the criteria that should be considered when submitting a macromolecular structure for publication.

Commission on Charge, Spin and Momentum Densities

The Commission continues to promote all kinds of effort related to the field of accurate determination of density distributions in real and momentum space among the crystallographic community and other interested scientists worldwide and to follow those experimental and theoretical activities which have a strong influence on the physical understanding of electron density distributions.

The most important activity of the Commission in 1990 was the organization of three Microsymposia at the XV IUCr Congress: Accuracy of Experimental Electron Densities; The Use of Charge Densities in Computer Simulation and Molecular Design; Extinction. The first one was held as an Open Commission Meeting. All three Microsymposia were well attended. In addition, the Commission has organized a Discussion Session on Accurate Electron Densities at the Congress, where Commission members and other interested scientists discussed thoroughly the new Commission Project on quantum-mechanical description of electronic structure from experimental charge and momentum densities. This project will include investigation of the extent to which the combination of accurate experimental density data, from position and momentum space, could enable direct access to wave functions and density matrices, respectively. Since one can now measure directly non-diagonal elements of density matrices in silicon, it has been agreed to follow the results of the discussion with high priority, with silicon as the appropriate model sample, as far as accuracy of available experimental and theoretical data are concerned. The next Sagamore Conference, held at Konstanz, Germany, in September 1991, will provide a good opportunity to finalize decisions on this project and to find people to take part in it. Another possible Commission project on evaluation and/or measurement of the electron density in perovskite structures will be discussed further at the Sagamore meeting.

Commission on Crystal Growth and Characterization of Materials

During 1990 the Commission continued its activities mainly focused on the involvement of crystal growth and

crystallography in modern materials science. In this respect, the Commission helped organize the First International Conference on Epitaxial Crystal Growth, Budapest, Hungary, 1-7 April 1990. This conference, where the Commission acted as Programme Committee, was attended by about 200 participants from 28 countries. The most important aspects of epitaxial crystal growth (fundamentals, technology, materials and device characterization and applications) were presented and discussed. The Commission also organized a Microsymposium on Crystal Growth in Microgravity during the XV IUCr Congress.

Continuing the successful series of schools sponsored by the Union, mainly for the benefit of young scientists from developing countries, the Commission helped organize the International School on Crystal Growth and Crystallographic Assessment of Industrial Materials, Sitges Barcelona, Spain, 13-25 May 1990, which was attended by 61 participants from 16 countries and was co-sponsored by the Spanish Group of Crystal Growth and the Spanish Ministry of Education and Sciences.

During the year, the Commission reconsidered its objectives. While confirming its former objectives, the Commission stressed the need for a stronger interaction with the International Organization for Crystal Growth and the national associations of crystal growth and a better definition of the actual relationship between the crystallographic and the crystal growth communities.

Commission on Crystallographic Apparatus

During 1990 work has continued on several of our existing projects and planning of further projects is proceeding.

(1) The X-ray Attenuation Project (D. C. Creagh): Volume C of *International Tables for Crystallography*, which will contain tables of absorption coefficients and dispersion corrections, will mark the completion of more than decade of work on this project. The fact that the tables are the result of theoretical computation rather than experimental measurement underscores the fragmentary and inaccurate nature of measurements of these parameters, which are crucial to the interpretation of X-ray diffraction data. A detailed comparison of experimental data with several contemporary theoretical data sets has recently been published [Creagh (1990). *Nucl. Instrum. Methods*, **A295**, 417-434].

The Commission has participated in discussions which led to the transfer of the X-ray Data File, compiled by Hubbell during his employment by the US National Bureau of Standards, to the National Nuclear Data Center (NNDC) (Brookhaven, USA) where, it is felt, the data may be made more available to scientists in general.

(2) The Single-Crystal Lattice Parameter Project (G. DeTitta): After some delay, caused by difficulties in obtaining suitable specimen materials, this project is now about to commence. Funding for the specimen crystals has been provided from the IUCr, with firm promises of additional financial support coming from the American Crystallographic Association and US industrial sources. Co-editors of *Acta Crystallographica* are assisting in the recruitment of participants and it is anticipated that more than 20 laboratories world wide will participate in the project.

(3) The Accuracy in XAFS Project (R. Frahm, H. Oyanagi and D. C. Creagh): Considerable concern still exists within the XAFS community concerning the state of both experimental procedures and theoretical computation

connected with all facets of XAFS. Two workshops, to try to understand the problems confronting XAFS users, have been held, and the results of the first have been published [Lytle, Sayers & Stern (1989). *Physica (Utrecht)*, **B152**, 701-721]. Although significant progress has been made in improving the awareness of the XAFS community of problems in the acquisition and analysis of data, a large number of incorrect XAFS papers are still being published in scientific journals. Checklists have been supplied to the editors of many major journals in an attempt to have authors of papers comply with a set of minimum requirements before their papers are published.

The Chairman of the Commission attended discussions which may lead to the establishment of an XAFS data file at the NNDC at Brookhaven, USA.

At the XAFS VI Conference (York, England) the Chairman of the Commission had discussions concerning the future of the XAFS community. Participants believed that the time had come for them to re-evaluate the structure of their organization, and one possibility would have been for the XAFS body to become a Commission of the IUCr. However, the organization structure of the XAFS body was inadequate, being largely an *ad hoc* system, and steps were taken to place the organization on a more formal footing. The decision on whether to become involved with the IUCr will be made at their next conference in 1992.

(4) Evaluation of Two-Dimensional Detectors: The Commission is conducting preliminary investigations to determine the possibility of creating a project to set up firm criteria for specifying and evaluating area detector performance.

(5) Workshop on X-ray Diffraction at High Pressures (R. Nelmes): A very successful Microsymposium on Crystallography at High Pressures was held at the XV Congress. To capitalize on the enthusiasm generated there, the High Pressure Group is organizing a workshop, in conjunction with the Synchrotron Radiation Instrumentation Conference, Chester, England, July 1991.

Commission on Crystallographic Computing

The following list gives the main activities of the Commission during 1990.

1. Commission members acted on the Programme Committee of the International School on Crystallographic Computing, Bischofsberg, France, 29 July-5 August 1990, a satellite meeting to the XV IUCr Congress.

2. Refereeing of the section *Computer Program Abstracts* in *J. Appl. Cryst.* Until July 1990 this work was undertaken by D. Viterbo and K. Watenpaugh. Since then it has been done by A. Olson and G. Reck.

3. Organization of a Microsymposium on Trends in Crystallographic Computing at the XV IUCr Congress.

4. School on Crystallographic Computing, Veszprém, Hungary, 1-7 June 1992. The Local Organizing Committee of this school is chaired by K. Simon, with G. Argay as Secretary. The Commission will act as the core of the international Programme Committee.

5. School on Crystallographic Computing, probably in Shanghai, People's Republic of China, as a satellite meeting to the XVI IUCr Congress. The Commission will act as the core of the international Programme Committee and as a source of organizational advice and contacts.

6. Attempts to instigate a worldwide bulletin board for crystallographic news were continued.

Commission on Crystallographic Data

This period has seen continued and close collaboration between this Commission, the Commission on Journals and the Working Party on Crystallographic Information to finalize proposals for the machine-readable submission of manuscripts to *Acta Crystallographica* and, thence, to the various crystallographic databases. In the first half of 1990, the computational structure and data name dictionary for the proposed Crystallographic Information File (CIF) were finalized. The CIF will form the basis for machine-readable submissions and for desktop publication of papers in *Acta* once suitable mechanisms have been established in the Editorial Office in Chester. The CIF proposals were approved and adopted by the Executive Committee during the XV IUCr Congress. The second half of the year has been taken up with the preparation of a manuscript describing the CIF for publication in *Acta* as a Commission Report. Further, there has been considerable liaison with the Chester Office concerning (a) the implementation of the CIF and associated software on their computing hardware, (b) the provision of software suitable for checking the numerical data in crystallographic papers, (c) the mechanisms for handling both machine-readable and hard-copy submissions and (d) suitable changes to *Notes for Authors* for structural papers in the journal.

The current CIF development covers small-molecule crystal structures of the type normally submitted to Section C of *Acta*. Extensions to cover powder diffraction data and protein structures are under development. Discussions are also under way with the developers of the standard molecular data format (SMD) with the intention of bringing the crystallographic and chemical standards together under the same computing protocols.

The Commission organized an Open Meeting at the IUCr Congress devoted to the CIF standard and the topic of machine-readable submission of data to journals and to databases. The meeting reinforced the need for the crystallographic structure solution software packages to be able to generate the CIF as a standard output file as soon as possible. The Commission also had a coordinating role in the organization of database demonstrations at the Congress.

The Executive Committee approved a proposal that any crystallographic database group that was not represented amongst the elected membership of the Commission should be asked to nominate a consultant to the Commission. This decision has resulted in the appointment of four such consultants and strengthens communication between the IUCr and the various crystallographic databases. In view of the present high level of collaboration between various IUCr Commissions, it was further agreed that the Chairman of the Commission on Crystallographic Data should be an *ex officio* member of the Commission on Journals.

The success of the Commission monograph *Crystallographic Databases* (1987) was discussed at a Closed Commission Meeting in Bordeaux. It was decided to defer a decision on a further edition of the monograph, but it was noted that the IUCr/OUP Book Series was a possible publication medium.

Commission on Crystallographic Nomenclature

The Commission voted in February 1990, following extensive discussion conducted largely by E-mail, to estab-

lish an *ad interim* Subcommittee on the Nomenclature of *N*-Dimensional Crystallography, charged with assessing the extent to which the representational symbolism currently in use in the field of *N*-dimensional crystallography has become so non-uniform that it is unacceptably ambiguous. If the results of this assessment so warrant, the Subcommittee will be further charged with proposing a set of recommendations for a unified nomenclature and symbolism for use in *N*-dimensional crystallography, following adequate discussion with other leaders in the field. By making *ad interim* appointments to the Subcommittee well before the opening of the XV IUCr Congress, the members were able to be in communication in advance of their meeting in Bordeaux. The final membership of the Subcommittee, as voted on by the Commission, was A. J. C. Wilson (Chairman), J. L. Birman, T. Janssen, W. Opechowski, V. Koptsik, M. Senechal, D. Weigel and H. Wondratschek, E. J. W. Whittaker was appointed consultant, with S. C. Abrahams, Th. Hahn and U. Shmueli as *ex officio* members.

The other current responsibility of the Commission consists of the work of its *ad hoc* Committee on the Nomenclature of Symmetry. An advanced report on recommended symbols for symmetry elements and operations is presently under consideration by the Committee. The last report of the *ad hoc* Committee was published in *Acta Cryst.* (1989), **A45**, 494-499.

The Commission met in Bordeaux to review the activities outlined above and to consider a number of proposals for undertaking studies of other areas in which crystallographic nomenclature problems exist. It agreed that, in general, it was preferable to issue as few nomenclature recommendations as possible. The problems proposed were judged not to warrant further consideration at this time.

Commission on Crystallographic Teaching

1. Teaching Schools: A Winter School was held in Bangkok, Thailand, in February 1990. Many aspects of crystallography, particularly those involving minerals and natural materials, were taught. There were 120 students, including 78 from Thailand. The lectures on the first day were held jointly with a meeting of natural products chemists. Since Thailand is famous for its gemstones, many aspects of teaching involved these.

2. The IUCr Visiting Professor Programme: C. H. L. Kennard will be the first IUCr Visiting Professor, at the University of Peradeniya, Sri Lanka. Information on this programme is being circulated widely to many countries. Different countries and organizations have their own specific requirements for input of crystallographic teaching. Some other locations for Visiting Professors are currently being considered.

3. IUCr Congress: A session on The Teaching of Crystallography; How to Engage and Encourage Science Students of the 1990s and Beyond was organized for the Congress. It was well attended and audience participation was good.

4. The Pamphlet Series: The pamphlets are concise descriptions of selected topics produced in a form suitable for teachers. The Chairmen of this series are H. Schenck and J. P. Glusker. A pamphlet by D. Weigel is in hand.

5. Resources for Teachers: The feasibility of using video tapes from various countries around the world is being investigated by H. von Philipsborn. There are difficulties because of different specifications for videos in different parts of the world.

6. The Use of Historical Material in Teaching: Items of historical interest add to the interest in teaching certain aspects of crystallography. J. Lima-de-Faria suggested starting a collection of material on the history of crystallography and preparing a catalogue listing where other collections of such material could be found. This idea is being investigated by a Subcommittee of the Commission chaired by A. L. Mackay. The *Historical Atlas of Crystallography*, edited by J. Lima-de-Faria, which was published for the IUCr in May 1990, has been very well received.

Commission on Electron Diffraction

The programme of the XV IUCr Congress, following recommendations from the Commission, included a Main Lecture by M. Tanaka and an Open Commission Meeting, both on Convergent Beam Electron Diffraction, as well as Microsymposia on Surface Structure by Electron Diffraction and Other Methods and Electron Microscopy of High- T_c Superconductors. These sessions presented an excellent review of some of the topics of current interest and were well organized and received.

The meeting in person of the Commission in Bordeaux was limited in numbers (three members, two consultants) but not in enthusiasm. One proposal made was for a school on electron diffraction computing to be held, possibly in conjunction with the 1993 IUCr Congress. Further discussion of this proposal includes the concept of two similar schools, one to be held in Asia and one in Europe, to allow easier access for students.

Commission activities include the multi-author book *Electron Diffraction Techniques* which, although greatly delayed, is now approaching final form with good prospects for publication in 1991.

A survey of computer programs being used for the calculation of intensities of high-resolution electron micrographs and electron diffraction patterns of crystals is being coordinated by D. Van Dyck, who has circulated a preliminary form of the proposed survey for comment. It is anticipated that the results of the survey will be submitted for publication.

Commission on Neutron Diffraction

Neutron scattering was prominent at the XV IUCr Congress and at the satellite meetings, the ensemble being a major scientific event. Those scientists with a strong constitution could attend either a Symposium on Short Range Order in Ill-Ordered Materials or a Symposium on Powder Diffraction; then the Congress with a Microsymposium on Dynamical Aspects of Neutron Scattering and many other sessions featuring neutrons, including a Main Lecture by J. W. White on Contrast Variation in Neutron Diffraction; and end with the Symposium on Complementary Applications of Diffraction by Neutrons and by X-ray Synchrotron Radiation. For reports on these meetings, see *Neutron News*, Vol. 1, No 4 (1990).

The Commission Newsletter was replaced from March 1990 by the Gordon and Breach publication *Neutron News*, edited by G. Lander, J. Axe and Y. Endoh. So far it has been very successful. It appears four times a year compared with about twice for the old Newsletter and is mailed free to several thousand registered neutron users compared with 800 before, as well as being available to advertisers and institutional subscribers. Through *Neutron News* the Commission, and in fact any neutron user, can address most of

the world's neutron community either *via* individual contributions or *via* the Chairman's column. Comments or criticism as to form or contents are welcomed by the Editor or the Commission Chairman (E-mail address mason@frill).

The Commission met during the IUCr Congress and discussed plans for the neutron meeting to be organized by C. T. Ye as a satellite of the XVI IUCr Congress in Beijing in 1993. H. G. Smith, the previous Chairman of the Commission, agreed to act as a consultant to the Commission until this meeting. The inaugural meeting of the Asian Crystallographic Association (AsCA) in Singapore in November 1992 may be another occasion for the Commission to contribute, as several major neutron facilities have been constructed recently in Asia and there will be many potential neutron crystallographers at the meeting; the Commission itself is well represented in Asia.

Commission on Powder Diffraction

During 1990, the Commission was involved with two meetings, one school and several projects.

Just before the XV IUCr Congress there was a satellite meeting on powder diffraction in Toulouse, France, which was very successful and was attended by 255 participants. The Commission also held two Closed Meetings for those members who attended the meeting in Toulouse. During the IUCr Congress there were two Microsymposia organized by the Commission; one was on Advances in Structure Determination from Powder X-ray Diffraction Data and the other on Powder Diffraction Studies on Fibrous Polymeric and Similarly Imperfectly Ordered Materials. The Commission also organized the discussion session on posters associated with the above-mentioned Microsymposia.

The Commission organized a Summer School for Beginners with the Rietveld Method, Cieszyn, Poland, 9–11 August 1990. This school was sponsored by the IUCr and received IUCr financial assistance for young scientists. There were about 100 applicants for the school but, even with the provision of additional computers, it was possible to accommodate only 58 students. The school appears to have been very successful and there is a real need for another such school, probably in 1992.

The Rietveld Refinement Round-Robin Project (R. J. Hill) was initiated in 1989. The study objects are two materials, *m*-ZrO₂ and ZSM-5, on which the participant collects powder diffraction data by his usual method and carries out Rietveld refinement with it. In addition, two sets of powder diffraction data, one neutron and one X-ray, on PbSO₄ are provided to the participants for them to carry out Rietveld refinements with their usual procedures. By mid 1990, 34 groups had indicated interest in participating and a number of them had already submitted their results.

The Program Information Exchange Bank (D. K. Smith) is developing well. It will take the form of an annotated compilation of titles and sources for computer programs for analysis of powder diffraction data. It is planned to publish the compilation in the *Journal of Applied Crystallography*, with updates about every two years.

Two Newsletters of the Commission were issued in 1990, each to a mailing list of about 1000 recipients.

The assistance of the international crystallographic and diffraction community is sought by the Commission to make them more aware of the various meetings, activities and needs related to powder diffraction in all parts of the world. The Commission would also welcome any suggestions for

other activities which the Commission might undertake that would be of benefit to the powder diffraction community.

Commission on Small Molecules

The Commission actively supported the small-molecule programme at the XV IUCr Congress, helped organize a Symposium in Germany, initiated plans for a satellite meeting to ECM-13 in 1991 and a Symposium in 1992, and continued its programme of international cooperation in intensity data collection. At the IUCr Congress the Microsymposia were attended by 150–200 people and the discussion sessions drew 75–125. These are impressive numbers in view of the competition presented by concurrent sessions on macromolecular structures, materials science and diffraction physics. While in Bordeaux the Commission members met to discuss plans for future meetings.

The third in a series of meetings was held in Schloss Elmau, Germany, 15–20 October 1990, entitled Computational Methods in Chemical Design. Molecular Modelling—Theory and Experiment. The meeting brought together theoreticians and experimentalists and was attended by nearly 200 participants including a number of young scientists. Lectures covered a broad range of topics, with the unifying theme of structural chemistry. A fourth symposium is planned for 1992.

The Commission has initiated plans for two other meetings. A Symposium on Biomolecular Structure and Dynamics will be held in Portoroz, Yugoslavia, 31 August–2 September 1991, as a satellite meeting of ECM-13. The Eighth Crystal Chemistry Symposium will be held in Rydzyna, Poland, 26–31 July 1992.

To date the Commission project of international cooperation in intensity data collection has been responsible for the collection of intensity data on 35 structures. In most cases, structures have been solved and have been, or will be, published. At present there are more applications for assistance than volunteers. Anyone needing intensity data or willing to collect data should contact W. L. Duax, Medical Foundation of Buffalo, 73 High Street, Buffalo, NY 14203, USA.

Commission on Synchrotron Radiation

The Commission was formally established at the XV General Assembly in Bordeaux in July. The programme of work started by the *ad interim* Commission over a year earlier was approved and the members of the *ad interim* Commission were formally elected. The membership includes people with experience in a broad range of diffraction techniques, including EXAFS, and people resident at synchrotron sites as well as outside users.

The activities of the Commission are described in *Synchrotron Radiation News*, published bimonthly by Gordon and Breach. In this way, the existence and work of the Commission has reached a very wide audience, resulting in some useful correspondence which is stimulating synchrotron-radiation research and conferences. The encyclopaedia of information, being gathered under the Global Instrumentation Survey, has already been supplied in preliminary form to working groups in Europe and the USA which are involved with the planning of biological crystallography and diffraction facilities at future synchrotron-radiation sources. Such surveys also provide a mechanism for monitoring performance and trends in the field, as well as orchestrating feedback to facilities and to users. The

considerable effort required to gather accurate information has been a major activity of the Commission. Similar reports for macromolecular crystallography, materials science crystallography, EXAFS and fibre diffraction instrumentation are well advanced and reports for high-pressure and surface diffraction instrumentation are in preparation.

At the XV IUCr Congress synchrotron radiation featured prominently in Plenary Lectures, many Microsymposia and poster sessions with their associated discussion meetings. One Microsymposium was entitled Synchrotron Radiation in Biological Diffraction. Future conferences being organized by the Commission include a satellite meeting to the 4th International Conference on Synchrotron Radiation Instrumentation, Chester, England, July 1991, entitled Synchrotron Radiation Instrumentation and Macromolecular Crystallography, and a satellite meeting of ECM-13, on Synchrotron Radiation in Crystallography.

Young though the field is, it is developing rapidly because of the immense utility of an intense polychromatic and collimated X-ray source. On the machine side there are also fascinating trends. In addition to building bigger, better centralized, machines, there are plans for compact machines (7 m diameter, 1.2 GeV energy, 6 T magnet) with a single beam line which could be stationed at individual universities.

Ad interim Commission on Modulated Structures, Polytypes and Quasi-crystals

No report was received for the General Assembly from this *ad interim* Commission. However, it was considered that the fields which this Commission was intended to cover were active and in need of representation within IUCr activities. The Executive Committee undertook to find the right people to assess these needs and to prepare firm plans for consideration by the Executive Committee in 1991. [This was, in fact, done and in April 1991 the Executive Committee approved the establishment of a Commission on Aperiodic Crystals on an *ad interim* basis until its formal establishment could be considered by the General Assembly in 1993.]

Sub-Committee on the Union Calendar

The Sub-Committee receives and considers requests for IUCr sponsorship and nominal financial support and makes recommendations to the Executive Committee. Acting on the recommendations made by the Sub-Committee, during 1990 the Executive Committee approved sponsorship of several schools and meetings, mostly with financial support. Those held in 1990 are listed at the beginning of this Report of the Executive Committee. Those scheduled for 1991, but approved in 1990, are listed below:

1. First European Powder Diffraction Conference, Munich, Germany, 14–16 March 1991.
2. Intensive Course in X-ray Structure Analysis, Aston, England, 18–24 March 1991.
3. International Workshop on Methods of Structure Analysis of Modulated Structures and Quasi-crystals, Bilbao-Lekeitio, Spain, 29 April–4 May 1991.
4. 3rd European Conference on Crystal Growth, Budapest, Hungary, 5–11 May 1991.
5. International Workshop on Modern Magnetic Materials and their Technological Impact, La Habana, Cuba, 19–29 May 1991.

6. 18th Course on Static, Kinematic and Dynamic Aspects of Crystal and Molecular Structure, Erice, Italy, 30 May–9 June 1991.

7. International Conference on Polytypes, Modulated Structures and Quasicrystals, Balatonszépplak, Hungary, 20–24 August 1991.

8. Thirteenth European Crystallographic Meeting, Ljubljana, Yugoslavia, 25–30 August 1991.

9. Summer School on Neutron Scattering, Oxford, England, 18–29 September 1991.

The organizers of all IUCr-sponsored meetings are requested to recommend the journals of the IUCr as a suitable channel of publication for the original papers presented at the meeting. If organizers intend to publish proceedings, they should consider the IUCr Crystallographic Symposia Series, which is published jointly by the IUCr and Oxford University Press.

Organizers of meetings wishing to seek IUCr sponsorship should submit applications at least nine months in advance of the date of the meeting, writing to the Chairman of the Sub-Committee. The present Chairman is Professor P. Coppins, Department of Chemistry, State University of New York at Buffalo, Acheson Hall, Buffalo, NY 14214, USA.

Applications for sponsorship of satellite meetings must be submitted through the Chairman of the Organizing Committee of the main meeting.

Regional Associates and Scientific Associates

American Crystallographic Association (ACA)

The ACA was accepted by the XV IUCr General Assembly in Bordeaux in July 1990 as a Regional Associate of the Union. Its application had been supported by the Canadian and US National Committees for Crystallography.

Unfortunately, although an IUCr Representative was appointed to the ACA Council, she was not invited to the only Council meeting held in 1990 after the IUCr General Assembly. This omission has now been rectified.

Asian Crystallographic Association (AsCA)

An AsCA Council meeting was held in Bordeaux on 21 July 1990. The newly elected Executive is Nobutami Kasai (President), Fang-ming Miao (Vice-President) and Yu Wang (Secretary and Treasurer). It was agreed to invite Bangladesh, Indonesia, Singapore and Vietnam to become member countries of AsCA. It was reported that the Korean Crystallographic Association was formed 23 September 1989 and that the Association consisted of about 100 crystallographers.

One of the principal activities of AsCA for the next triennium will be to continue regular newsletters about crystallographic activities in the region and in a number of related societies. The inaugural scientific meeting of AsCA will be held in Singapore, 14–16 November 1992, in conjunction with a joint meeting of the Crystallographic Society of Japan and the Society of Crystallographers in Australia.

European Crystallographic Committee (ECC)

There was no European Crystallographic Meeting in 1990, because this was the year of an IUCr Congress. However, the ECC met twice during the period of the XV IUCr Congress in Bordeaux in July.

The Academy of Scientific Research and Technology of the Arab Republic of Egypt was accepted unanimously as a member of the ECC. The meeting received and accepted reports on the next European Crystallographic Meeting (ECM-13), to be held in Ljubljana, Yugoslavia, 25–30 August 1991, together with related satellite meetings, and on the International Conference on Polytypes, Modulated Structures and Quasicrystals, to be held in Balatonszéplak, Hungary, 20–24 August 1991. It also reviewed plans for ECM-14, to be held at Twente, The Netherlands, 2–7 August 1992 and ECM-15, to be held in Leipzig, Germany, 21–25 August 1994. The Committee unanimously agreed to sponsor the First European Powder Diffraction Conference, to be held in Munich, Germany, 14–16 March 1991.

Dr K. Huml (Czechoslovakia) was elected Chairman of the ECC and Professor H. Fuess (Germany) was elected Vice-Chairman. Dr H. Flack (Switzerland) was elected Secretary of the ECC. These appointments run until mid 1993.

International Organization for Crystal Growth (IOGG)

There was no formal activity by the IOGG during 1990. Its main activity is the organization, every three years, of an International Conference on Crystal Growth (ICCG) and an International Summer School on Crystal Growth (ISSCG). The last ones were held in Japan in 1989 and the next will be held in the USA in 1992. In between, the activity of the crystal growth community is reflected by the many conferences, workshops, schools *etc.* organized by the National Associations of Crystal Growth formally affiliated to the IOCG. Some of these events have an international character, as in the case of the American Conferences of Crystal Growth and the European Crystal Growth Meetings. Particularly active in this respect are the American, German, British and French Associations, which also circulate periodic Newsletters.

It is felt that the Union should try to establish formal links, possibly through the Commission on Crystal Growth and Characterization of Materials, with these National Associations to provide an effective interaction between the crystal growth community and the crystallographic community.

Joint Committee on Powder Diffraction Standards–International Centre for Diffraction Data (JCPDS–ICDD)

The IUCr Representative attended the October 1990 meeting of JCPDS–ICDD. A major change occurred regarding the proposed format for the next generation of the Powder Diffraction File, with strong support for the Crystallographic Information File (CIF) format developed by S. R. Hall, F. H. Allen and I. D. Brown for the IUCr. The acceptance of the CIF format by other international organizations such as the JCPDS is essential if this format is to become the international standard for which purpose it was developed.

Cooperation between the JCPDS and the IUCr, with respect to their journals *Powder Diffraction* and the *Journal of Applied Crystallography*, continues to be strengthened.

The international aspect of JCPDS's activities continues to grow. Over 60% of its grants go to recipients outside the USA and it routinely organizes workshops and financially supports meetings in many countries. One such meeting was a satellite meeting to the XV IUCr Congress, the Symposium on Powder Diffraction, Toulouse, France,

16–19 July 1990, which was well attended and very successful. Among the workshops planned for 1991 are ones in connection with the meetings of the British Crystallographic Association in Sheffield and the European Powder Diffraction Conference in Munich, both in March, and the 13th European Crystallographic Meeting in Ljubljana, Yugoslavia, in August.

Representatives on Other Bodies

IUPAP Commission on the Structure and Dynamics of Condensed Matter (CSDCM)

The main activity of this Commission is to give preliminary examination to applications for sponsorship by IUPAP of conferences within its field of interest and to make appropriate recommendations to IUPAP. The work is done by infrequent correspondence. There is nothing to be reported in 1990. Therefore, on the suggestion of the IUCr Representative, the Executive Committee decided in Bordeaux that IUCr representation on this Commission should be terminated.

Action Committee on Conferences and the Condensed Matter Division of the European Physical Society (EPS)

The Action Committee on Conferences convened on 27 March 1990 in Uppsala, Sweden. Of the 72 new applications for EPS sponsorship, 37 were accepted and 9 rejected. Decisions on the other, very recent, requests were deferred until the next meeting of the Committee. The improvement of applications and their administration was thoroughly discussed.

In accordance with the decision made in November 1989, the Action Committee was reorganized. In the future a task force consisting of five persons will primarily handle every relevant issue in the work of the Committee. The IUCr Representative received an invitation to serve on the task force but, due to the substantially increased expenses which would occur along with the increased number of meetings (at least three per year), this invitation was politely declined. Instead, he agreed with the EPS Executive Secretary, who has moved his office from Petit-Lancy to Budapest, to maintain contact by correspondence, and by telephone within Budapest, and to attend the Committee meetings only if it would be really worthwhile for the IUCr.

The IUCr Representative continued to attend the meetings of the Board of the Condensed Matter Division, enjoying now a 'permanently invited' status. The Board met during the Tenth General Conference of the Division, which was held in Lisbon, Portugal, 9–12 April 1990. The President of the EPS, Professor R. A. Ricci, addressed the Board. He reported that EPS would support the European Gordon Conferences, known as Fermi Conferences, and explained the actions by EPS with respect to the changes in Eastern Europe and the unification of the Physical Societies in Germany. Verbal reports were received on the present General Conference of the Division and on the plans for the General Conference in 1991, which will be held in Exeter, England, in April. Various steps were being taken to assist the attendance of young participants from Eastern Europe.

It was agreed that the 1992 General Conference should be held in Prague, Czechoslovakia, and preliminary approval was given to the holding of the 1993 General Conference in Germany.

The Board also met on 3 December in Petit-Lancy, Switzerland. Reports were received on meetings on various sections of the Condensed Matter Division, including those concerned with liquids, low temperatures, macromolecular physics, magnetism, semiconductors and insulators, surface interfaces, metals and high-pressure research. The IUCr Representative reported on the XV IUCr Congress. He drew attention to the establishment of an IUCr Commission on Synchrotron Radiation which, together with other bodies, would seek proper cooperation with EXAFS specialists and other experts working in solid-state physics and chemistry.

Formal acceptance was given to the invitation from the Deutsche Physikalische Gesellschaft to hold the 1993 General Conference in Regensburg.

IUPAC Interdivisional Committee on Nomenclature and Standards (IDCNS)

The annual meeting of IDCNS was held in September 1990 in Cambridge, England. It was attended by the alternate to the IUCr Representative to reduce travel costs for the Union. Matters of interest to the IUCr included recommendations for extending the present set of prefixes to signify decimal multiples and submultiples of SI units, consideration of a name and symbol for a unit quantity without dimensions and a satisfactory definition of the kilogram, which is the only arbitrary unit left in SI. The IDCNS recently became a member of the Comité Consultatif des Unités du Conférence Générales des Poids et Mesures (CCU) and is thus able to contribute to their recommendations. Since final recommendations by CCU are likely to be adopted by the authorities responsible for SI units and hence have an impact on crystallography, it may be advisable for the IUCr to seek membership in CCU.

International Council for Scientific and Technical Information (ICSTI)

The annual meeting of ICSTI was held in Gatlinburg, Tennessee, USA, on 16 May and was preceded by associated meetings on 13–15 May. There were often two or three simultaneous meetings, but some of those attended by the IUCr Representative are reported on below.

Group on Education and User Needs: A draft report is expected soon on the survey of educational materials and courses provided by ICSTI members. A survey of organizations providing information aid to developing countries is also in progress.

Numeric Data Group: The project *Numeric Databases: an ICSTI Directory* (provisional title) should be published before the end of the year. Difficulties are being experienced with the elimination of duplicate entries for the same database from different sources, particularly for crystallographic databases.

Group on Legal Aspects of Information Transfer: The main topic of discussion was the chapter on databases from the European Commission's 'Green Paper' on *Copyright and the Challenge of Technology*. There was little of immediate concern to the IUCr, although the Commission's final directives might have some impact on the various crystallographic databases. The possibility was raised of large legal expenses and compensation payments in actions for damages arising from the use of inaccurate information in databases. During the discussion of copyright claims by

database producers, the general opinion was that data producers could not claim copyright of biographic details if the format were altered. However, it was considered that reproduction of abstracts in any format would be a breach of copyright, except in so far as it was covered by 'fair use' clauses.

Working Group in Chemistry: The group discussed a paper compiled by G. Poetzsch, entitled *User Needs in Chemical Information*. It was considered necessary to rewrite this paper, which the IUCr Representative, A. J. C. Wilson, did. It has now been published under the names of Poetzsch and Wilson [*J. Chem. Inf. Comput. Sci.* (1990), **30**, 169–173].

ICSTI is likely to produce a *Standard World List of Journal Titles*, to replace various out-of-date publications, and has been asked to collaborate with ICSU on information programmes, in particular one on global warming.

The next meeting will be in Nancy, France, 10–12 May 1991, to be followed by a Symposium entitled Squaring the Information Circle.

International Council of Scientific Unions (ICSU)

The 23rd General Assembly of ICSU and the associated meeting of its General Committee were held in Sofia, Bulgaria, 1–5 October 1990. In an apparent attempt to reduce expenditure, it was decided that the General Assembly should meet every three years, rather than every two years. The General Committee will continue to meet every year. Unfortunately for the IUCr, this change means that the ICSU General Assemblies will now be held in the same years as the IUCr General Assemblies, which may sometimes lead to a clash in dates.

An *ad hoc* Committee was established to look urgently into the problems affecting scientific research in central and eastern Europe and to prepare a programme of measures whereby ICSU might help remedy the difficulties. As in the past, ICSU continues to place emphasis on science in developing countries, but their projects are not relevant to crystallography. The ICSU Lectureship Programme, which is rather similar to the IUCr Visiting Professor Programme, appears to be proceeding very slowly. In between the full General Assembly sessions there were meetings of three working groups. One of these was for the National Members and the other two for the International Unions which are members of ICSU. The IUCr was a member of the Working Group for the Earth, Space, Physical, Chemical and Mathematical Sciences, which invited the Representative of each Union to talk briefly on the highlights of scientific developments in its own sphere of activities. This proved to be a very interesting exchange of information.

ICSU Committee on Data for Science and Technology (CODATA)

The dates of the 1990 CODATA Conference and General Assembly, in Columbus, Ohio, USA, clashed with those of the XV IUCr Congress in Bordeaux, so that IUCr Representative was not able to attend the CODATA meetings.

ICSU Committee on Science and Technology in Developing Countries (COSTED)

The IUCr Representative received no communication from COSTED during 1990.

ICSU Committee on Space Research (COSPAR)

The 28th Plenary Meeting of COSPAR was held in The Hague, The Netherlands, 25 June–7 July 1990, but no report of this meeting has been received from the then IUCr Representative. A new Representative was appointed at the IUCr General Assembly in Bordeaux, a few weeks after the above-mentioned COSPAR meeting.

ICSU Committee on the Teaching of Science

No report has been received from the IUCr Representative.

Finances

The audited accounts of the year 1990 are given at the end of this Report. For comparison, the figures for 1989 are provided in italics. The accounts are presented in Swiss Francs.

The Unesco rates of exchange, as issued by the ICSU Secretariat, have been used in the preparation of these accounts. As a consequence of the many fluctuations in exchange rates during the year, the following procedure has been adopted for the accounts. Assets and liabilities in currencies other than Swiss Francs at 31 December 1990 have been translated into Swiss Francs in the balance sheet at the rate operative at that date. For the income and expenditure accounts, transactions have been translated into Swiss Francs by applying the rates of exchange appropriate to the individual dates of these transactions. As a consequence of the fluctuations in exchange rates, an apparent loss has arisen on the assets of the Union, in terms of Swiss Francs, amounting to SwFr 722 528. This loss has been divided amongst the Fund Accounts in direct proportion to the balances on these accounts at 31 December 1990. It should be noted that this loss in Swiss Francs is not a real loss of money, but rather a loss on paper resulting from the accounts being expressed in Swiss Francs.

Investments are noted in the balance sheet at their market value at 31 December 1990. The difference between revalued cost and market value has been shown as an adjustment in order that the investments can be stated at cost. This prevents the fluctuations in value from influencing the General Fund. The revalued cost is obtained by converting the cost of investments in the currencies of purchase into Swiss Francs using the exchange rates operative on the balance sheet date.

The total of SwFr 651 380 with the banks at the end of the year was represented by Dfl 6479 and US \$255 with the Amsterdam–Rotterdam Bank, US \$159 517 with Merrill Lynch, £172 877 with the National Westminster Bank and SwFr 9041 with the Union Bank of Switzerland.

The balance sheet shows that the assets of the Union, excluding stocks of unsold publications but including the loss of SwFr 722 528 resulting from fluctuations in rates of exchange, have decreased during the year, from SwFr 5 183 168 to SwFr 4 773 398.

No new fund accounts were established in 1990. A transfer of SwFr 500 000 was made to the Publications and Journals Development Fund from the *Acta Crystallographica* Fund and two transfers were made to the Research and Education Fund, SwFr 100 000 from the *Acta Crystallographica* Fund and SwFr 200 000 from the General Fund. A transfer of SwFr 15 000 was made to the Ewald Fund from the *Journal of Applied Crystallography* Fund and a transfer of SwFr 25 000 was made to the President's Fund

from the General Fund, to provide additional funds for cases of special need.

Beneath the detailed figures of the expenditure and income for each fund account, the balance at 1 January, the difference between income and expenditure for the year and the fluctuations in rates of exchange during the year are given, showing how the balance at 31 December is obtained.

The General Fund account shows a surplus of SwFr 357 524, before the transfers totalling SwFr 225 000 to the Research and Education Fund and the President's Fund, as compared with a surplus of SwFr 263 985 in 1989. The administrative expenses were SwFr 239 644 in 1990 as compared with SwFr 199 340 in 1989. Of this amount, SwFr 72 009 was charged to the publications of the Union.

SwFr 49 245 was spent on travel grants for the IUCr Congress, SwFr 18 515 on supporting other scientific meetings (in addition to the SwFr 76 145 for financial support to young scientists attending meetings, which appears in the expenses of the Research and Education Fund), and SwFr 20 841 on travel grants to enable the Chairmen of non-publishing Commissions to attend the IUCr General Assembly. The travel expenses of the Union Representatives on other bodies were SwFr 3677. The cost of the two Finance Committee meetings held in 1990 was SwFr 11 701, whilst the Executive Committee meeting cost SwFr 42 159. The Union received SwFr 21 234 from the Unesco subvention to ICSU. The subscriptions from Adhering Bodies remained unchanged at SwFr 133 500. Interest on bank accounts and investments credited to the General Fund was SwFr 340 328.

In 1989 the Executive Committee decided that the Publications and Journals Development Fund, the Research and Education Fund and the Ewald Fund should be credited with a share of the interest income received by the Union. Previously this had been done only for the Ewald Fund, which had been established with bequests from the Ewald family and equal contributions from the Union. This procedure was extended to include the President's Fund in 1990. These funds receive interest, at a nominal rate of 8% per annum, on the balances in the funds at the end of each month.

The President's Fund account therefore received interest of SwFr 1286, in addition to a donation of SwFr 50 and the already-mentioned transfer of SwFr 25 000 from the General Fund. Grants totalling SwFr 1524 were paid from the fund.

The *Acta Crystallographica* account for 1990 shows a surplus of SwFr 224 290 before the transfer of SwFr 600 000 to other fund accounts, as compared with a surplus of SwFr 229 909 in 1989 before transfers of SwFr 80 000.

The subscription rates were increased for 1990; the first increase since 1983. More pages were published in 1990 than in 1989, with the removal of the backlog of *Acta C* papers held over from 1989 because of the implementation of new technologies and staff shortages in the technical editing office and at the typesetters, but the costs per page decreased, when expressed in Swiss Francs, because of changes in the exchange rates of the Danish Krone, the Pound Sterling and the US Dollar as compared with the Swiss Franc.

The number of paid subscriptions to all sections of *Acta*, including 100 personal subscriptions in 1989 and 99 in 1990, decreased from 1097 in 1989 to 1082. However, the number of paid subscriptions to the separate sections of the journal

increased from 262, 181 and 133 in 1989 to 268, 187 and 141 in 1990 for Sections A, B and C, respectively. As usual, the cost of the technical editing office has been divided between the *Acta Crystallographica* and the *Journal of Applied Crystallography* accounts in percentages based on the number of text pages published during the year, namely 88 and 12% respectively for 1990. For 1989 the percentages were 84 and 16%. The technical editing costs for *Acta Crystallographica* were SwFr 370 551, as compared with SwFr 340 504 in 1989. The journal's accounts have also been charged with administrative expenses as in previous years and as shown in the General Fund.

The *Journal of Applied Crystallography* account shows a surplus of SwFr 75 633, before the transfer of SwFr 15 000 to the Ewald Fund, as compared with a surplus of SwFr 42 707 in 1989. The number of pages published in 1990, 560 pages, was less than in 1989, when it was 642. The number of subscriptions, including 107 personal subscriptions in 1989 and in 1990, increased from 1022 in 1989 to 1032 in 1990.

The *Structure Reports* account shows a surplus of SwFr 9670 in 1990 as compared with a surplus of SwFr 60 765 in 1990. Only one A Series volume was published in 1990, so that the sales income and the publication expenses were considerably less than in 1989 when two A Series volumes and one B Series volume were published. Editorial expenses were also less than those of 1989 but the level of these expenses does fluctuate from year to year. Publishing and editorial expenses in 1990 were SwFr 14 866 and SwFr 28 612 respectively, as compared with SwFr 60 043 and SwFr 37 181 in 1989. The net income from sales was SwFr 53 148 in 1990 as compared with SwFr 157 989 in 1989.

The *International Tables* account shows a deficit of SwFr 32 161, as compared with a deficit of SwFr 46 867 in 1989. These deficits will continue to occur until Volumes

B and C are published and substantial sales income is received for these two volumes. Virtually all the expenses incurred in 1990 relate to these unpublished volumes. A realistic date for their publication is now 1992. The net sales income of SwFr 75 305 derived mostly from the sale of 308 copies of Volume A, but 341 copies of the Teaching Edition of Volume A were also sold.

The Book Fund includes the sales of the remaining publications of the Union. The *Historical Atlas of Crystallography*, edited by J. Lima de Faria, was published just before the XV IUCr Congress in Bordeaux, and has proved to be very popular. SwFr 170 was received from the sales of *Escher Kaleidozyklen*, the remaindered stock of which was purchased by the Union in 1988. SwFr 813 was received from the sale of *Crystallographic Databases*, compiled by the Commission on Crystallographic Data and published in 1987.

The *Molecular Structures and Dimensions* account shows almost negligible sales, because no volume has been published since 1984.

As mentioned earlier, the income for the Publications and Journals Development Fund account, the Research and Education Fund account and the Ewald Fund account includes interest as well as transfers from other fund accounts. In the former account the expenses of SwFr 232 970 for computer expenses, including the purchase of computing equipment and software for the Chester office, all relate to the technical editing of the journals. In addition, there was an expense of SwFr 62 500, being part of the costs of refurbishing the Chester offices. SwFr 76 145 for financial support to young scientists, to enable them to attend scientific meetings sponsored by the Union, was charged to the Research and Education Fund account.

The only expense for the Ewald Fund in 1990 was the second Ewald Prize (\$20 000), which was presented at the XV IUCr Congress to B. K. Vainshtein.

International Union of Crystallography Balance Sheet as at 31 December 1990

	Swiss Francs		1989		1990		1989	
	As at 1 January 1990	Fluctuations in rates of exchange (Note 2)	Excess of income over expenditure for the year	Balance at 31 December 1990	CURRENT ASSETS			
FUND ACCOUNTS					Cash at banks	17,536	44,190	
General Fund	1,170,342	-171,282	132,524	1,131,584	Current accounts	633,844	555,883	600,073
President's Fund	16,686	-5,456	24,812	36,042	Deposit and savings accounts	651,380		
<i>Acta Crystallographica</i>	2,090,433	-225,427	-375,710	1,489,296	Cash with Union officials	12,861		11,123
<i>Journal of Applied</i>					Debtors, accrued income and	244,016		342,577
<i>Crystallography</i>	442,674	-66,168	60,633	437,139	payments in advance			
<i>Structure Reports</i>	134,260	-18,922	9,670	125,008	Subscriptions from Adhering			
<i>International Tables</i>	176,773	-19,012	-32,161	125,600	Bodies, due for 1990	8,010		8,900
Book Fund	11,989	-1,285	-2,213	8,491		916,267		962,673
<i>Molecular Structures</i>					<i>Deduct</i> Creditors, accrued			
<i>and Dimensions</i>	6,120	-805	—	5,315	charges and income received	353,881		277,063
Publications and					in advance			
Journals						562,386		685,610
Development Fund	543,020	-103,014	240,557	680,563	NET CURRENT ASSETS			
Research and	372,377	-81,683	248,946	539,640	INVESTMENTS (Note 4)			
Education Fund	218,494	-29,474	5,700	194,720	At market value	4,071,054	4,748,245	
Ewald Fund					Change in market value	106,924	-270,633	
	5,183,168	-722,528	312,758	4,773,398	At revalued cost	4,177,978		4,477,612
					FIXED ASSETS			
					Office equipment at revalued	33,034	19,946	
					cost, less depreciation			
						4,773,398		5,183,168

Report of the Auditors to the International Union of Crystallography

We have audited the financial statements on pages 618-630 in accordance with Auditing Standards.

We have not been requested by the Union to consider the requirements of Swiss Company Law as regards these financial statements.

In our opinion, the financial statements give a true and fair view of the state of affairs of the Union at 31 December 1990 and of its excess of income over expenditure and source and application of funds for the year then ended.

Manchester, England
5th April 1991

Signed: TOUCHE ROSS & CO

Chartered Accountants

Calculation of the balance of the General Fund Account at 31 December

	1990	1989
Balance at 1 January	1,170,342	900,605
Difference between income and expenditure	132,524	223,985
Fluctuations in rates of exchange	-171,282	45,752
Balance at 31 December	<u>1,131,584</u>	<u>1,170,342</u>

President's Fund Account for the year ended 31 December 1990

	Swiss Francs		Swiss Francs	
	1990	1989	1990	1989
Grants	1,524	—	Donations received	50
<i>Excess of income over expenditure</i>			Interest (note 6)	1,286
<i>carried to balance sheet</i>	24,812	—	Transfers from other Funds:	—
	<u>26,336</u>	<u>—</u>	General Fund	25,000
Balance at 1 January	16,686	16,034		<u>26,336</u>
Difference between income and expenditure	24,812	—		
Fluctuations in rates of exchange	-5,456	652		
Balance at 31 December	<u>36,042</u>	<u>16,686</u>		

Acta Crystallographica Account for the year ended 31 December 1990

	Swiss Francs			Swiss Francs	
	1990	1989		1990	1989
Publication expenses:					
Printing and binding Volume 46 (1989 Volume 45)	586,118	462,305	Subscriptions to Volume 46 (1989 Volume 45)	1,582,371	1,378,642
Distribution and postage	127,753	98,801	Sale of back numbers and single copies	19,102	31,348
Airfreight costs	41,604	38,825	Airfreight charged to subscribers	51,278	54,078
	<u>755,475</u>	<u>599,931</u>	Sale of microfiche back volumes	—	1,183
Printing Acta Supplement to Volume A46	28,594	—	Net profit on reprints	10,944	6,595
Biological crystallography journal	3,767	—	Royalties and copyright fees	1,386	662
Index to Volume 45 (1989 Volume 44)	14,886	15,338		<u>1,665,081</u>	<u>1,472,508</u>
Five Year Index 1983-1987	—	51,735	Less Publisher's commission on sales	112,080	1,553,001
Microfiche back volumes	—	921		<u>1,553,001</u>	<u>1,367,631</u>
Documenter	17,758	820,480	Income from advertisements (net)	1,170	2,142
	<u>820,480</u>	<u>667,925</u>			
Editorial expenses:					
Editorial honoraria	33,746	40,519			
Secretarial assistance	19,981	19,757			
Postage and sundries	31,241	26,477			
Technical Editing:					
Salaries and expenses	342,151	322,133			
Computer expenses	19,966	12,621			
Depreciation of office equipment	8,434	5,750			
	<u>455,519</u>	<u>427,257</u>			
Administration expenses	53,882	44,682			
Transfers to other Funds:					
Publications and Journals	500,000	40,000			
Development Fund	100,000	40,000			
Research and Education Fund		80,000			
	<u>600,000</u>	<u>80,000</u>			
Excess of income over expenditure carried to balance sheet	<u>1,929,881</u>	<u>1,369,773</u>	Excess of expenditure over income carried to balance sheet	<u>375,710</u>	<u>1,369,773</u>
				<u>1,929,881</u>	<u>1,369,773</u>
Balance at 1 January	2,090,433	1,858,802			
Difference between income and expenditure	-375,710	149,909			
Fluctuations in rates of exchange	-225,427	81,722			
	<u>1,489,296</u>	<u>2,090,433</u>			
Balance at 31 December	<u>1,489,296</u>	<u>2,090,433</u>			

	1990	Swiss Francs	1989		1990	Swiss Francs	1989
Publication expenses:				Sale of copies			
Printing and binding				Volume 55A			
Volume 55A				(1989 Volumes 49A, 49B and 54A)	46,103		181,714
Typing of manuscripts	7,062		46,450	Earlier volumes and indexes	25,718		31,785
	7,804	14,866	13,593				
					71,821	213,499	
Editorial expenses:				Less Publisher's commission			
Editorial honoraria	28,261		36,209	on sales	18,673	53,148	157,989
Travel and sundry expenses	351	28,612	972				
Excess of income over expenditure		9,670	60,765				
carried to balance sheet							
		53,148	157,989			53,148	157,989
Balance at 1 January	134,260		68,246				
Difference between income and expenditure	9,670		60,765				
Fluctuations in rates of exchange	-18,922		5,249				
Balance at 31 December	125,008		134,260				

International Tables Account for the year ended 31 December 1990

	Swiss Francs	
	1990	1989
Publication expenses:		
Reprinting Volume A	—	34,905
Reprinting Teaching Edition of Volume A	—	7,580
Typesetting Volume B	15,150	9,559
Typesetting Volume C	24,350	14,339
Reprinting Volumes II and IV	—	26,362
	39,500	92,745
Editorial expenses:		
Editorial honoraria	10,250	11,690
Secretarial assistance, postage and office equipment	24,271	16,154
Technical Editing	33,445	14,804
	67,966	42,648
	107,466	135,393
Balance at 1 January	176,773	216,729
Difference between income and expenditure	-32,161	-46,867
Fluctuations in rates of exchange	-19,012	6,911
Balance at 31 December	125,600	176,773
	107,466	135,393
	32,161	46,867
	107,466	135,393
	26,458	31,073
	75,305	88,526
	101,763	119,599
	27,762	35,097
	6,428	6,771
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	107,466	135,393
	26,458	31,073
	75,305	88,526
	101,763	119,59

	Swiss Francs		Swiss Francs	
	1990	1989	1990	1989
Publication Expenses:				
<i>Escher Kaleidozyklen</i>	36	50		
<i>Crystallographic Databases</i>	—	110		
Book series expenses	187	—		
<i>Atlas of Crystallography</i>	12,019	9,957		
<i>World Directory of Crystallographers</i> ,				
8th Edition	1,270	696		
Sundry Publications	259	—		
Sale of copies, net of				
Publisher's commission on sales				
<i>Atlas of Crystallography</i>			7,922	—
<i>Escher Kaleidozyklen</i>			170	881
<i>Crystallographic Databases</i>			813	6,671
<i>Fifty Years of X-ray Diffraction</i>			133	324
<i>Escher Drawings</i>			787	472
<i>Early Papers</i>			103	542
<i>Fifty Years of Electron Diffraction</i>			56	348
<i>World Directory of Crystallographers</i> ,				
7th Edition			151	419
<i>World Directory of Crystallographers</i> ,				
8th Edition			136	—
Sundry publications			245	405
Royalties				
<i>Escher Drawings</i>			300	250
Book series – IUCr				
Crystallographic Symposia			742	968
<i>Excess of expenditure over income</i>				
<i>carried to balance sheet</i>				
	—	467	2,213	—
	13,771	11,280	13,771	11,280

Balance at 1 January	11,989	11,053
Difference between income and expenditure	-2,213	467
Fluctuations in rates of exchange	-1,285	469
	<hr/>	<hr/>
Balance at 31 December	8,491	11,989
	<hr/>	<hr/>

Research and Education Fund Account for the year ended 31 December 1990

	1990	Swiss Francs 1989		1990	Swiss Francs 1989
Expenses:			Transfers from other Funds:		
History of the Union	1,976	210	Acta Crystallographica	100,000	40,000
Young Scientists' Support	76,145	78,996	General Fund	200,000	80,000
ACA Video Grant	—	8,050			
Report on Teaching	—		Interest (note 6)	27,673	24,825
Crystallography	606	606			
IUCr Publications	606	848			
	<u> </u>	<u> </u>		<u>327,673</u>	<u>104,825</u>
Excess of income over expenditure carried to balance sheet					
	<u>248,946</u>	<u>16,115</u>			
	<u>327,673</u>	<u>104,825</u>			
Balance at 1 January	372,377	341,705			
Difference between income and expenditure	248,946	16,115			
Fluctuations in rates of exchange	-81,683	14,557			
	<u>539,640</u>	<u>372,377</u>			
Balance at 31 December					

Ewald Fund Account for the year ended 31 December 1990

	1990	1989	Swiss Francs
Prize	26,582	—	1990
Selection Committee and expenses	—	1,952	1989
<i>Excess of income over expenditure carried to balance sheet</i>	5,700	13,728	Transfers from other Funds
	32,282	15,680	<i>Journal of Applied Crystallography</i>
			Interest (note 6)
			15,000
			17,282
			32,282
			15,680
Balance at 1 January	218,494	196,224	
Difference between income and expenditure	5,700	13,728	
Fluctuations in rates of exchange	-29,474	8,542	
Balance at 31 December	194,720	218,494	

Statement of Source and Application of Funds
Year ended 31 December 1990

	Swiss Francs	
	1990	1989
Source of funds		
Excess of income over expenditure for the year	312,758	489,083
Adjustment for items not involving the movement of funds:		
Fluctuations in rates of exchange	-722,528	202,627
Depreciation	13,210	8,173
Fluctuations in rates of exchange on office equipment and investments	623,902	-173,632
Profit on sale/redemption of investments	-193,007	-39,422
Total generated from operations	34,335	486,829
Increase in creditors, accrued charges and income received in advance	76,818	44,453
Proceeds of sale/redemption of investments	1,056,222	1,199,992
Decrease in debtors and accrued income (including subscriptions)	99,451	—
	<u>1,266,826</u>	<u>1,731,274</u>
Application of funds		
Increase in debtors and accrued income (including subscriptions)	—	-224,142
Purchase of office equipment	-26,424	-11,332
Purchase of investments	-1,187,357	-2,286,417
	<u>53,045</u>	<u>-790,617</u>
Movement in net liquid funds		
Net liquid funds include cash at banks and with Union officials.		

Notes to the Financial Statements

1. Accounting Policies

(a) Accounting convention

The financial statements are prepared under the historical cost convention.

(b) Rates of exchange

Unesco rates of exchange as issued by the ICSU Secretariat are used in the preparation of the financial statements.

Assets and liabilities held in currencies other than Swiss Francs at the balance sheet date are translated into Swiss Francs at the rates operative on that date.

The revalued cost of fixed assets and investments referred to in the balance sheet and Note 4 to the accounts arises by applying this method.

In each of the income and expenditure accounts, transactions in currencies other than Swiss Francs are translated by applying the rates of exchange appropriate to the individual dates of the transactions.

Profits and losses arising from the fluctuations in rates of exchange during the year are divided between the fund accounts with credit balances in direct proportion to those balances at the closing balance sheet date.

(c) Publication costs

Publication, editorial and administrative expenses of publications are charged in the appropriate income and expenditure account as and when incurred.

(d) Stocks of unsold copies of Union publications

Stocks of unsold copies of publications are not valued for accounting purposes.

(e) Expenditure on premises

Expenditure on renovation and refurbishing is charged against the appropriate income and expenditure accounts in the year in which it is incurred.

(f) Depreciation

(i) Office equipment is depreciated on the straight line basis at a rate of 20% per annum.

(ii) Office computer equipment is fully depreciated in the year of purchase.

2. Rates of exchange

The assets of the Union are recorded in the financial statements in Swiss Francs but are held in currencies which are considered to be appropriate to the Union's requirements. It therefore follows that the effect of fluctuations in exchange rates will normally only arise at the year end when the figures are reported in Swiss Francs.

The rates of exchange operative at the balance sheet date compared with the Swiss Franc were as follows:

	1990	1989
Netherland Guilders	1.3464	1.2547
Danish Crowns	4.5512	4.3234
Pounds Sterling	0.4000	0.3975
US Dollars	0.7874	0.6211

The total assets of the Union at 1 January 1990 (SwFr 5,183,168) would have had the value of US \$3,219,226 or £2,060,309 if expressed in those currencies.

At 31 December 1990 these assets (SwFr 4,777,735) would have had the value of US \$3,761,989 or £1,911,094 respectively, being an increase of US \$542,763 or decrease of £149,216 from the previous year.

3. Taxation

As an association incorporated in Switzerland, the Union is exempt from Swiss Federal and Geneva Cantonal tax.

Under the terms of the United Kingdom/Switzerland Double Taxation Agreement dated 8 December 1977, investment income arising within the United Kingdom under present circumstances will not be subject to United Kingdom tax.

Other investment income received from countries with which Switzerland has a Double Taxation Agreement is exempt from tax.

4. Investments

	Swiss Francs				
	Holding at revalued cost 1 January 1990	Additions during the year	Disposals/ Redemptions during the year	Fluctuations in rates of exchange	Holding at revalued cost 31 December 1990
Held by Rothschild Asset Management Limited £300,000 (Old Court International Reserves Limited)	754,656	—	-751,397	-3,259	—
Held by Merrill Lynch (Corporate Government Securities)					
US \$20,903 GNM P146535-2016	37,465	—	-2,962	-8,656	25,847
US \$63,700 GNM P169332-2016	109,209	—	-4,791	-25,643	78,775
US \$36,000 US Treasury May 1991	49,431	—	—	-11,840	37,591
US \$84,000 US Treasury May 2001	49,738	—	—	-11,913	37,825
US \$150,000 US Treasury November 2004	75,188	—	—	-18,009	57,179
(Mutual Funds/Unit Investment Trusts)					
2,231 Units ML Capital Fund/CLB (US \$)	80,574	—	—	-17,016	53,558
4,306 Units ML Basic Value Fund/CLB (US \$)	128,879	—	-104,065	-24,814	—
US \$4,750 Templeton Worldwide Fund G	83,688	—	—	-20,045	63,643
US \$4,750 Templeton Worldwide Fund I	83,688	—	—	-20,045	63,643
US \$590 Haussman Holdings	173,510	97,996	—	-43,820	227,686
US \$5,139 Global Equity Portfolio (Certificates of deposit)	82,364	1,599	—	-19,764	64,199
US \$50,000 FHLMC 8-5% Sept 15 20RG	82,058	—	—	-19,655	62,403
US \$50,000 CITI CDT Cards 8-25% Nov. 15 193	83,632	—	—	-20,032	63,600
Held by Foreign & Colonial					
34,298 Units Reserve Asset Fund Class D (US \$)	969,227	—	—	-204,681	764,546
9,126 Units Reserve Asset Fund Class L (£)	222,770	65,438	—	66	288,274
33,482 Units Reserve Asset Fund Class O (US \$)	681,683	20,484	—	-148,284	553,883
27,575 Units Reserve Asset Fund Class X (£)	729,852	—	—	-4,526	725,326
Held by Coutts					
£400,000 cash on one year deposit	—	1,001,840	—	-1,840	1,000,000
	<u>4,477,612</u>	<u>1,187,357</u>	<u>-863,215</u>	<u>-623,776</u>	<u>4,177,978</u>

Investments are noted in the balance sheet at their market value at 31 December 1990. The difference between revalued cost and market value has been shown as an adjustment in order that the investments can be stated at cost. This prevents the fluctuations in value from influencing the General Fund.

The revalued cost is obtained by converting the cost of investments in the currencies of purchase into Swiss Francs using the exchange rates operative on the balance sheet date.

Included in investments above is SwFr 1,000,000 which is invested in a one year bank deposit account at Coutts, which is due to mature on 20 August 1991. It is the intention of the officers of the Union to reinvest this money on maturity. This money is not considered to be part of the general deposit and savings accounts available as day to day working capital of the Union and has therefore not been included within the current assets of the Union.

5. Bank Interest

	Swiss Francs	
	1990	1989
National Westminster Bank PLC		
Manchester Deposit Account	—	413
Manchester SMMO Account	63,730	39,777
Manchester Business Reserve Account	19,620	6,900
Amsterdam-Rotterdam Bank NV		
Current Guilder Account	22	59
Guilder Savings Account	71	524
Guilder 1 month deposit	3,718	2,530
US \$ Account	21	13
Union Bank of Switzerland		
Current Account	—	36
Merrill Lynch		
CMA Account	10,611	15,743
Foreign & Colonial		
Cash balances	243	12
Interest from Munksgaard	20,640	21,170
Interest on officers' petty cash accounts	84	85
	<u>118,760</u>	<u>87,262</u>

6. Investment Interest

	Swiss Francs	
	1990	1989
ML Basic Value Fund	2,699	5,552
ML Capital Fund	3,851	6,977
P146535-2016	2,772	3,386
P169332-2016	8,312	9,901
CD Goldome	—	3,953
FHLMC 8.5% Sept. 15 20RG	5,993	—
Templeton Worldwide Fund G	4,788	—
Templeton Worldwide Fund I	6,553	—
Global Equity Portfolio	1,599	—
USA Income	—	3,402
Foreign and Colonial Fund X	101,986	98,790
Foreign and Colonial Fund D	58,004	52,302
Foreign and Colonial Fund L	48,450	79,772
Foreign and Colonial Fund O	6,999	73,894
CD Coast	—	1,219
CD Richmond	—	1,150
CD Calif Fed S&L 89	—	1,100
CITI CDT Cards	5,816	553
Coutts deposit account	48,333	—
Withholding tax recovered	—	4,872
	<u>306,155</u>	<u>346,823</u>
Less: Rothschild management fees	2,319	4,565
	<u>303,836</u>	<u>342,258</u>
Allocated to President's Fund	1,286	—
Allocated to Ewald Fund	17,282	15,680
Allocated to Publication and Journals Development Fund	36,027	38,755
Allocated to Research and Education Fund	27,673	24,825
Balance left in General Fund	221,568	262,998
	<u>303,836</u>	<u>342,258</u>