

International Union of Crystallography

Report of the Executive Committee for 1980

Personal Notes

Professor J. M. Bijvoet died on 4 March 1980. His research work on phase determinations in complicated crystal structures brought him international acclaim. He played an important role in the early life of the Union, and was elected President of the Union in 1951, following Professor W. L. Bragg in this position. He was a Co-editor of *Structure Reports* between 1951 and 1966. After his retirement he prepared, with G. Hägg and W. G. Burgers, the two impressive volumes of *Early Papers on Diffraction of X-rays by Crystals*. An obituary has been published [*Acta Cryst.* (1980), A36, 837–838].

Dr W. H. Barnes died on 25 October 1980. He played a major role in the development of X-ray crystallography in Canada, and was Chairman of the Canadian National Committee for Crystallography from 1948 to 1967. He was Chairman of the Organizing Committee for the IVth International Congress of Crystallography held in Montreal in 1957 and was a member of the Union's Executive Committee from 1960 to 1966. An obituary has been published [*Acta Cryst.* (1981), A37, 269].

Professor B. N. Delaunay died on 17 July 1980. He was a corresponding member of the Academy of Sciences of the USSR and a Federov prizewinner. He contributed to the second volume of *International Tables for X-ray Crystallography*.

Meetings

The Union sponsored the following meetings in 1980: Winter School on Crystallographic Computing, Bangalore, India, 4–14 January; Spring School on New Crystallographic Perspectives in Materials Science, Erice, Italy, 8–21 April; Sixth European Crystallographic Meeting, Barcelona, Spain, 28 July–1 August; Sixth International Conference on Crystal Growth, Moscow, USSR, 10–16 September; Fourth International Specialist's School on Crystal Growth, Susdal, USSR, 17–25 September.

The Executive Committee met at Barcelona, 24–28 July, where the Programme Committee for the Twelfth Congress of Crystallography also met 22–24 July. The most important items of business dealt with were (1) the arrangements for the Twelfth General Assembly and Congress with the Programme Committee; (2) establishment of an in-house computerized phototypesetting system, consideration of subscription rates and other matters concerning the Union's journals; (3) other publications of the Union; (4) sponsorship of meetings; (5) approval of the audited accounts for 1979; (6) the General Fund estimates and the level of the unit contribution for 1982–1984; (7) suggestions from National

Committees for membership of the Executive Committee and the Commissions; (8) establishment of a Commission on Biological-Macromolecule Crystallography; (9) the proposed location of the Fourteenth General Assembly and Congress.

Resignations and Appointments

Professor J. M. Cowley, Dr P. J. Wheatley and Professor M. M. Woolfson resigned as Co-editors of *Acta Crystallographica*, and Professor J. B. Cohen resigned as a Co-editor of the *Journal of Applied Crystallography*.

The Executive Committee confirmed the appointment of Professor R. Colella, Dr T. A. Hamor, Dr S. Jagner and Dr B. T. M. Willis as Co-editors of *Acta Crystallographica*, and Dr H. L. Yakel as a Co-editor of the *Journal of Applied Crystallography*.

Publications

Volume 36 of *Acta Crystallographica* and Volume 13 of the *Journal of Applied Crystallography* were published in 1980, as were Volumes 43B (1976) and 44A (1977) of *Structure Reports* and Volume 11 of *Molecular Structures and Dimensions*.

Adhering Bodies

The latest list of Adhering Bodies of the Union, and the names and addresses of the Secretaries of the National Committees, is given in Table 1. A full list of memberships of National Committees is given in Annex IV to the Report of the Eleventh General Assembly and Congress [*Acta Cryst.* (1979), A35, 1021–1067]. The following changes, in addition to those listed in the report for 1979 [*Acta Cryst.* (1980), A36, 1072], to the memberships of committees had been communicated to the Executive Secretary by 1 June 1981:

Belgium: R. Gevers (Chairman), L. Danguy (Vice-Chairman), S. Amelinckx, H. Brasseur, F. Durant, H. S. Geise, L. Habraken, G. Jacobs, G. S. D. King, E. Legrand, J. Moreau, P. Piret, J. Toussaint, J. F. Van Landuyt, M. Van Meerssche, J. Vennik.

Norway: J. Hvosløf (Chairman), O. Foss, J. Gjønnnes, F. Grønvald, A. Hordvik, B. F. Pedersen, T. G. Strand, H. Sørum.

Sweden: S. Abrahamsson (Chairman), I. Olovsson (Vice-Chairman), B. Aurivillius, O. Beckman, D. Carlström, N. Ingri, G. Johansson, P. Kierkegaard, B. Lindqvist, I. Lindqvist, G. Lundgren, B. Strandberg, A. Magnéli, F. E. Wickman.

Table 1. *Adhering Bodies*

<i>Country</i>	<i>Category*</i>	<i>Adhering Body</i>	<i>Secretary of National Committee</i>
Argentina	I	Consejo Nacional de Investigaciones Científicas Técnicas	M. A. R. DE BENYACAR, Division Física del Sólido, Comisión Nacional de Energía Atómica, Av. del Libertador 8250, 1429 Buenos Aires
Australia	III	Australian Academy of Science	The Executive Secretary, Australian Academy of Science, PO Box 783, Canberra City, ACT 2601
Austria	I	Österreichische Akademie der Wissenschaften	A. PREISINGER, Institut für Mineralogie, Kristallographie und Strukturchemie der Technischen Universität Wien, Getreidemarkt 9, A-1060 Vienna
Belgium	II	Académie Royale des Sciences, des Lettres et des Beaux-Arts de Belgique	G. S. D. KING, Laboratorium voor Kristallografie, Katholieke Universiteit Leuven, Redingenstraat 16 bis, B-3000 Leuven
Brazil	III	Conselho Nacional de Desenvolvimento Científico e Tecnológico	S. CATICHA ELLIS, DESCM, Instituto de Física, Universidade Estadual de Campinas, Campinas, São Paulo 13100
Canada	III	National Research Council	C. P. HUBER, Division of Biological Sciences, National Research Council of Canada, Ottawa, Ontario K1A 0R6
Chile	I	National Committee for Crystallography	I. GARACOCHEA WITTKE, Departamento de Física, Universidad de Chile, Casilla 5487, Santiago
China, People's Republic of	IV	Academia Sinica	GU XIAOCHENG, Department of Biology, Beijing University, Beijing
Czechoslovakia	I	Československá Akademie Věd	A. LÍNEK, Fyzikální ústav, Československá Akademie Věd, Libeň, Na Slovance 2, 1980 40 Praha 8
Denmark	I	Royal Danish Academy of Sciences and Letters	B. LEBECH, Physics Department, Risø National Laboratory, DK-4000 Roskilde
Egypt, Arab Republic of	I	Academy of Scientific Research and Technology	S. ABDEL-HADY, Faculty of Engineering & Technology, Cairo Higher Institute of Technology, Helwan, Cairo
Finland	I	Suomalainen Tiedeakatemia	L. TAHVONEN, Department of Physics, University of Helsinki, Siltavuorenpenger 20c, SF-00170 Helsinki 17
France	IV	Académie des Sciences (Institut de France)	Y. EPELBOIN, Association Française de Cristallographie, Tour 26, 4 place Jussieu, 75230 Paris CEDEX 05
German Democratic Republic	II	Vereinigung für Kristallographie in der GGW der DDR	H. PEIBST, Zentralinstitut für Elektronenphysik, Akademie der Wissenschaften der DDR, Mohrenstrasse 40/41, DDR-108 Berlin
German, Federal Republic of	IV	Arbeitsgemeinschaft Kristallographie	K.-J. RANGE, Fachbereich Chemie & Pharmazie, Institut für Chemie, Universitätsstrasse 31, 8400 Regensburg
Hungary	I	Magyar Tudományos Akadémia	L. ZSOLDOS, Research Institute for Technical Physics, Hungarian Academy of Sciences, PO Box 76, H-1325 Budapest
India	I	Indian National Science Academy	P. KRISHNA, Department of Physics, Banaras Hindu University, Varanasi 221005
Israel	I	Israel Academy of Sciences and Humanities	Z. SHAKKED, Department of Structural Chemistry, The Weizmann Institute of Science, Rehovot
Italy	III	Consiglio Nazionale delle Ricerche	G. FILIPPINI, Istituto di Chimica Fisica, Università di Milano, Via Golgi 19, Milano
Japan	IV	Science Council of Japan	Y. TAKÉUCHI, Mineralogical Institute, Faculty of Science, The University of Tokyo, 3-1 Hongo 7-chome, Bunkyo-ku, Tokyo 113
Netherlands	III	Stichting voor Fundamenteel Onderzoek der Materie met Röntgen-en Elektronenstralen	The Executive Secretary, FOMRE, Koningin Sophiestraat 124, 2595 TM, The Hague
New Zealand	I	The Royal Society of New Zealand	J. M. WATERS, Chemistry Department, University of Auckland, Private Bag, Auckland
Norway	I	Det Norske Videnskaps-Akademi	B. F. PEDERSEN, Department of Pharmacy, University of Oslo, PO Box 1068, Blindern, Oslo 3
Poland	I	Polska Akademia Nauk	A. PIETRASZKO, Instytut Niskich Temperatur i Badań Strukturalnych, Polskiej Akademii Nauk, Plac Katedralny, 1, 50-950 Wrocław

* Adherence to the Union is in one of five Categories I-V, with corresponding voting powers and contributions as set out in Statutes 3-6, 5.5 and 9.4.

Table 1 (cont.)

Country	Category*	Adhering Body	Secretary of National Committee
South Africa	I	South African Council for Scientific and Industrial Research	P. LE R. MALHERBE, International Relations Division, CSIR, PO Box 395, Pretoria 0001
Spain	III	Consejo Superior de Investigaciones Científicas	S. MARTÍNEZ-CARRERA, Instituto de Química Física 'Rocasolano', Consejo Superior de Investigaciones Científicas, Serrano 119, Madrid 6
Sweden	II	Kungliga Vetenskapsakademien	P. KIERKEGAARD, Arrhenius Laboratory, University of Stockholm, S-106 91 Stockholm
Switzerland	II	Schweizerische Gesellschaft für Kristallographie	W. M. MEIER, Institut für Kristallographie und Petrographie, Sonneggstrasse 5, ETH-Zentrum, CH-8092 Zürich
UK	V	The Royal Society	The Executive Secretary, The Royal Society, 6 Carlton House Terrace, London SW1Y 5AG
USA	V	National Academy of Sciences—National Research Council	H. STEINFINK, Department of Chemical Engineering, The University of Texas at Austin, Austin, TX 78712
USSR	V	Akademija Nauk SSSR	V. I. SIMONOV, Institute of Crystallography, Leninsky prospekt 59, Moscow 117333
Yugoslavia	I	Jugoslavenska Akademija Znanosti i Umjetnosti	B. KAMENAR, Laboratory of General and Inorganic Chemistry, Faculty of Science, Ulica Soc. Revolucije 8, 41 000 Zagreb

* See footnote on preceding page.

USA: R. A. Young (Chairman), R. E. Newnham (Vice-Chairman), W. R. Busing, J. B. Cohen, W. L. Duax, D. J. Duchamp, H. A. Hauptman, D. van der Helm, G. A. Jeffrey, Q. C. Johnson, J. Karle, K. A. Kerr, B. W. Matthews, C. T. Prewitt, D. Sayre, R. A. Sparks, H. Steinfink, B. J. Wuensch, H. W. Wyckoff.

Work of the Commissions

Commission on Journals

Volume 36 of *Acta Crystallographica* and Volume 13 of the *Journal of Applied Crystallography (JAC)* were produced in 1980. The number of papers and pages in *Acta A*, Volume 36 increased very slightly compared to Volume 35, see Table 2. *Acta B* contained slightly fewer papers in 1980 than in 1979, but a small increase in average length resulted in more pages published although the information density per page remained about constant. Five percent more crystal structure papers appeared in the short structural paper format than as full articles in *Acta B*, Volume 36 compared to ten percent more in Volume 35. The total number of pages in *JAC* remained about constant in 1979 and 1980 but fewer articles were published in all categories.

Median publication times, calculated from the published date of acceptance to the nominal date of issue, lengthened by one to three weeks in all categories for *Acta* between 1979 and 1980. Publication times for these two years in *Acta A* were 4.8 and 5.1 months respectively for full articles, 4.2 and 4.7 months for short communications. In *Acta B*, they were 4.1 and 5.0 months respectively for full articles, 3.8 and 4.3 months for short structural papers, and 3.4 and 3.9 months for short communications. The increases are directly attributable to the effects of an industrial dispute at the printers which caused a major backlog in composing and printing articles in summer 1980. Publication times for full articles in *JAC* were reduced from 5.4 to 4.9 months between 1979 and 1980, and from 5.2 to 4.7 months for short items.

The informal grouping of structural papers as inorganic, organometallic, or organic used in the last two volumes of *Acta* has been continued in *Acta B36*. The number and percentage of papers in the three subject groupings has remained fairly constant between Volumes 35 and 36 both for full articles and for short structural papers. A total of 116 inorganic, 100 organometallic and 201 organic full articles appeared in 1980 with 85 inorganic, 117 organometallic and 236 organic short structural papers. The expanded format of the *Index to Acta A* and *B* used in Volumes 34 and 35, allowing information to be more readily retrievable than with a smaller *Index*, was again used for Volume 36.

The distribution of papers and authors by country in *Acta A*, in *Acta B* and in the *JAC* for 1979 and 1980 is given in Table 3. Papers from 55 different countries were published in the IUCr journals in 1979 and 1980. The three largest absolute changes in year-to-year distribution for papers published in *Acta A* were for India, Sweden and Japan: in *Acta B*, the three largest changes were for the UK, Poland and the USA: and in *JAC*, they were the USA, France and the UK. An author is counted in Table 3 for each paper he published; hence the totals for each country are often larger than the actual number of publishing crystallographers in that country.

R. Colella, S. Jagner, T. A. Hamor and B. T. M. Willis were appointed Co-editors of *Acta* in succession to J. M. Cowley, P. J. Wheatley and M. M. Woolfson whose resignations had been accepted. H. Yakel was appointed Co-editor of *JAC* in succession to J. B. Cohen.

Commission on Structure Reports

Volume 43B (Organic Compounds for 1977, 1603 pages in two parts) and Volume 44A (Metals and Inorganic Compounds for 1978, 387 pages) were published in 1980.

Volume 45A (Metals and Inorganic Compounds for 1979, about 450 pages) is with the printer and should appear in mid-1981; Volume 44B (Organic Compounds for 1978) is being prepared for printing. Co-editorial work is proceeding on Volumes 45B, 46A, and 46B.

Table 2. *Survey of the contents of the Union Journals*

<i>Acta Crystallographica</i>														
Vol.	Year	Number of pages*		Number of papers		Full Articles				Short Structural Papers		Short Communications		
						Number	Average length	Number	Average length	Number	Average length	Number	Average length	
A31} †	1975	880}	3824	171}	885	140}	586	6.1}	5.4	—	—	31}	69	1.4}
B31}		2944}		714}		446}		5.2}		230		2.4		38}
A32}	1976	1038}	4398	188}	1011	152}	687	6.0}	5.2	—	—	36}	64	1.1}
B32}		3360}		823}		535}		5.0}		260		2.5		28}
A33}	1977	1046}	5020	201}	1192	181}	729	5.6}	5.3	—	—	20}	54	1.5}
B33}		3974}		991}		548}		5.2}		409		2.6		34}
A34} †	1978	1048}	4896	189}	1229	158}	668	6.0}	5.2	—	—	31}	71	1.3}
B34}		3848}		1040}		510}		5.0}		490		2.5		40}
A35}	1979	1090}	4220	187}	1085	162}	574	6.0}	5.0	—	—	25}	54	1.5}
B35}		3130}		898}		412}		4.7}		457		2.5		29}
A36}	1980	1096}	4308	194}	1071	168}	585	6.1}	5.3	—	—	26}	48	1.3}
B36}		3212}		877}		417}		5.0}		438		2.5		22}

Journal of Applied Crystallography

Vol.	Year	Number of pages* ‡		Full Articles §		Short Communications		Crystal Data		Computer Programs		Short Items ¶	
				Number	Average length	Number	Average length	Number	Average length	Number	Average length	Number	Average length
8 ‡	1975	698	201	80	5.6	17	1.7	25	1.5	4	2.0	6	0.6
9	1976	514	136	71	6.2	19	1.6	25	1.6	3	1.7	18	0.5
10	1977	510	134	76	5.5	14	1.8	22	1.3	6	1.6	15	0.9
11 ‡	1978	733	167	47	5.5	11	1.6	20	1.2	3	2.0	12	1.0
12	1979	642	168	87	6.8	13	1.5	42	1.6	11	1.8	14	0.6
13	1980	638	130	81	6.2	6	2.0	25	1.8	7	2.7	11	1.0

* Excluding indexes.

† Volume A31 includes, in addition, 338 pages of abstracts communicated to the Amsterdam Congress and Volume A34 includes, in addition, 431 pages of abstracts communicated to the Warsaw Congress.

‡ Volume 8 includes 149 pages of 18 papers and 50 abstracts presented at the International Discussion Meeting on Studies of Lattice Distortion and Local Atomic Arrangements, Jülich, 1974. Volume 11 includes 363 pages of 4 review papers, 50 contributed papers, and 17 extended abstracts presented at the Fourth International Conference on Small-Angle Scattering, Gatlinburg, 1977. The columns giving the number of pages and the number of papers in each volume include all these papers and abstracts, but the columns giving the number and average length of Full Articles do not include the conference papers.

§ Excluding Lead Articles and Conference papers.

¶ Excluding Union Announcements, Crystallographers, and Book Reviews.

Commission on International Tables

During 1980 the final lay-out for the plane-group and space-group tables was prepared by the printers. The proofs of these tables were distributed in the autumn of 1980 to all members of the editorial team. The results of the proof-reading were processed by the Editor early in 1981 and were transmitted to the Union's Technical Editor in February.

The preparation of the text of the introduction continued throughout the year. At the end of this year about 60% of the text had been completed and sent to the Technical Editor for preparation for printing. The rest of the manuscript was in an advanced stage of preparation and is scheduled for completion by the summer of 1981.

Commission on Charge, Spin and Momentum Densities

This year there were no meetings directly sponsored by the Commission, but Commission members were involved in the

Second Gordon conference on charge density in hydrocarbons which was held in July in New Hampshire. The proceedings of the NATO Advanced Study Institute on *Electron and Magnetisation Densities in Molecules and Crystals*, edited by P. Becker also appeared in 1980.

The oxalic acid project continues, with X-ray data now being contributed by several groups. The feasibility of establishing a structure-factor data bank was investigated by M. S. Lehmann, and as a result this year the data bank has been established at the University of Erlangen by H. Burzlaff.

The dates of the Sagamore VII conference in Japan have been fixed as 25–30 August 1982.

Commission on Crystal Growth

The main activities of the Commission this year were the organization of the Spring School in Erice and the pre-

Table 3. *Distribution of papers and authors, by country, in the Union journals for 1979 and 1980*

Errata have been excluded.

The papers have been allocated to the country or countries where the work was done, directly proportional to the number of authors per country for each paper.

The authors' nationalities have been given where known. If an author's nationality is not known to be otherwise it is given as that of the country in which the work was done.

Country	<i>Acta Crystallographica</i>								<i>Journal of Applied Crystallography</i>			
	Section A				Section B				Papers		Authors	
	Papers	Authors	Papers	Authors	Papers	Authors	Papers	Authors	Papers	Authors	Papers	Authors
	1979	1980	1979	1980	1979	1980	1979	1980	1979	1980	1979	1980
Algeria	—	—	—	—	—	1.3	—	5	—	—	—	—
Argentina	1	—	2	1	—	2.6	—	13	1	1.0	2	3
Australia	10.3	8.2	17	17	15	17.9	31	52	9.5	3.0	21	7
Austria	—	0.8	—	4	1.7	4.0	3	6	1.4	2.0	3	2
Bangladesh	—	—	—	—	—	—	—	—	—	—	1	1
Belgium	0.7	—	2	—	29.6	18.2	117	80	1	1.0	2	2
Brazil	1	—	1	—	2	4.0	4	14	—	—	—	—
Bulgaria	1	—	2	—	—	—	—	—	—	—	—	—
Canada	4.3	2.0	6	2	39.4	48.0	102	111	5	3.0	11	8
Chile	—	—	—	—	1	0.4	4	2	—	1.0	—	2
China, People's Rep.	—	—	—	—	—	—	—	—	—	—	—	2
Costa Rica	—	—	—	—	—	0.6	—	3	—	—	—	—
Cuba	—	0.3	—	1	—	—	—	—	—	1.0	—	—
Czechoslovakia	3	1.0	6	2	10.5	9.0	34	34	1.7	1.0	4	3
Denmark	4.5	0.8	10	3	7.1	4.0	13	8	0.6	0.7	3	2
Egypt	—	1.0	—	2	—	—	—	—	—	—	—	—
Finland	3	3.3	7	6	11.6	11.6	27	30	2	—	4	—
France	17.1	14.1	37	34	131.2	141.9	423	352	34.1	25.2	76	70
Germany Dem. Rep.	—	—	—	—	1.3	1.4	5	6	1	1.0	2	3
Germany, Fed. Rep.	19	16.4	32	29	82.1	86.7	214	181	13.4	8.3	32	16
Greece	—	—	—	—	3	3.0	8	10	—	—	—	—
Hong Kong	—	—	—	—	1.5	—	5	2	—	—	—	—
Hungary	—	0.7	—	2	3.3	5.1	15	19	—	0.3	—	3
India	7	15.0	16	30	16	15.3	38	41	6	4.0	16	13
Iran	—	—	—	—	0.5	—	1	—	—	1.0	—	1
Iraq	—	—	—	—	—	—	—	1	—	—	—	—
Ireland	—	—	—	—	3	3.0	7	9	—	—	—	—
Israel	4	0.3	7	1	7	12.1	8	22	1.7	3.3	4	6
Italy	7.9	9.7	15	23	35.7	38.7	100	110	6.3	5.0	19	13
Ivory Coast	—	—	—	—	3.2	1.1	11	5	—	—	—	—
Japan	15.2	21.0	37	56	56	61.1	192	215	10	12.0	21	29
Libya	1	—	2	—	1	—	2	—	—	—	—	—
Netherlands	10.1	7.9	24	22	35.3	19.8	90	45	1.3	4.0	2	9
New Guinea	—	—	—	—	—	0.3	—	1	—	—	—	—
New Zealand	—	1.0	—	3	3	3.0	5	8	—	—	—	—
Norway	2.3	—	4	—	5	1.7	9	5	—	2.0	—	4
Pakistan	—	1.0	—	6	—	—	—	—	—	—	—	—
Poland	3.2	1.0	7	2	29.4	56.8	81	150	0.5	1.0	1	3
Portugal	1	—	1	—	1	1.0	2	5	—	—	—	—
Romania	—	1.0	—	2	—	—	—	—	1	—	3	—
Saudi Arabia	—	—	—	—	1.5	1.0	2	1	—	—	—	—
South Africa	—	1.0	—	1	10	10.0	25	31	1	1.0	3	1
Spain	—	—	—	1	14.7	11.0	50	38	3	0.9	3	3
Sweden	6	—	11	—	36.2	30.9	66	55	5.5	4.3	14	13
Switzerland	4.7	9.3	10	16	11	20.2	23	43	5	1.3	8	3
Taiwan	—	—	—	—	—	2.0	—	8	—	—	—	—
Thailand	—	—	—	—	—	—	—	2	—	—	—	1
Tunisia	—	—	—	—	0.7	0.6	2	3	—	—	—	—
Turkey	—	—	—	—	1	—	1	—	—	0.3	—	1
Uruguay	—	—	—	—	—	—	—	1	—	—	—	1
USSR	2	7.0	8	17	2.5	2.7	11	7	1.3	—	3	—
UK	23.1	24.5	45	56	99.7	64.8	270	199	18.9	13.0	42	20
USA	33.1	31.8	66	60	159.8	132.9	439	378	37	27.4	80	63
Venezuela	—	0.3	—	1	—	—	—	—	—	—	—	—
Yugoslavia	0.8	0.5	2	1	11.2	17.4	27	49	3	3.0	8	11

liminary work for two Microsymposia in Ottawa and a School in New Delhi.

About 120 participants attended the International School of Crystallography, 'New Crystallographic Perspectives in Materials Science', which was held 8–21 April 1980 in Erice, Italy, at the 'Ettore Majorana Centre for Scientific Culture'. The Directors of the course were A. Authier and E. Kaldis, Executive Secretary L. Riva di Sanseverino, Program and Admission Committee A. Authier, M. Hart, E. Kaldis and A. Zichichi. The lectures were chosen to diminish the gap between the classical university education in crystallography and the actual tasks which young crystallographers could solve in solid-state research and materials science. They focused on groups of important materials (electronic, amorphous, for energy conversion, for hydrogen storage, etc.), phenomena (structure–property relations, nonstoichiometry, defect structure, surface properties, segregation of impurities) and characterization methods (lattice imaging, topography, precise determination of lattice parameters in single crystals among others).

The Commission is organizing two Microsymposia under the general subjects 'Materials Science and Crystallography' and 'Fundamental Aspects of Crystal Growth' at the Congress in Ottawa. The aim of the programme is to present some recent developments in materials science and crystal growth, helping to build a bridge between these disciplines and crystallography.

The International School on 'Synthesis, Crystal Growth and Characterization of Materials for Energy Conversion and Storage' will now be held in New Delhi, 12–23 October 1981. The School will be held at the National Physical Laboratory on the occasion of the 60th birthday of its Director, Dr A. R. Varma. It was decided to focus one group of lectures on the materials for energy conversion and storage and another group on some important topics of materials science and crystal growth. The Commission wishes to help the numerous young Indian scientists who have very little chance to come into direct contact with the latest developments in these fields.

The strong involvement of the Commission in the field of materials science reflects the decision taken by its members last year to enlarge the field of activities and to change the name of the Commission. It is believed that in this way a contribution to a future development of crystallography can be made.

Commission on Crystallographic Apparatus

All Commission matters were dealt with by correspondence. A planned business meeting during the Sixth European Crystallographic Meeting was cancelled because very few members and consultants would have been able to attend.

1. *Microdensitometer Project* (S. Abrahamsson, P. Kierkegaard, G. Lundgren). Phase two of the project concerns a comparison between data from the same crystal recorded on film and on a diffractometer. A first report will be presented at a microsymposium at the IUCr Congress in Ottawa.

2. *Survey of Film Characteristics* (M. Elder, O. S. Mills). Various film properties are evaluated such as relative speed for Cu K radiation, granularity at different optical densities, fog density, film factor, amount of silver per mm² film, characteristic curve, thickness and weight of coating. The

speed and fog density have been remeasured after a six-month interval. Some 30 film types have been tested including the new X-ray film developed by CEA-verken in Sweden. A final report will be presented at the IUCr Congress.

3. *X-ray Attenuation Project* (D. C. Creagh). 15 sets of silicon samples have been distributed to laboratories which originally indicated their willingness to participate in the project. Since then several more enquiries have been received and additional samples have been fabricated. Some results have already been received and a comprehensive report will be given in connection with a microsymposium at the IUCr Congress.

4. *Polarization Ratio Survey* (L. D. Jennings). Because of the complex physical state of a typical crystal monochromator it is unrealistic to attempt to calculate its polarization ratio on a theoretical basis. Therefore it is important to measure the ratio as part of the routine of setting up a diffraction apparatus. Several laboratories have performed such measurements but not always made them available to the Commission survey. The result of this project so far will be published soon in an IUCr journal.

5. *New projects*. A number of new Commission projects have been proposed and will be discussed at meetings during the IUCr Congress. They include:

(a) Accurate determination of X-ray intensities on diffractometers (H. Hope). The methods for experimental determination of electron densities have improved drastically during the last decade. A systematic study of the procedure of obtaining accurate X-ray data is therefore considered appropriate. It has furthermore been suggested that an international meeting on the accurate determination of structure factors be arranged with support from the Commission. This will be considered in relation to the activities of other Commissions.

(b) Absolute Intensity Calibration for Neutron Small-Angle Scattering Facilities (R. Hendricks, G. D. Wignall). The aim of the project will be to test the reproducibility and comparative accuracy of the various techniques in current use and to clarify the areas of difficulty in absolute intensity calibration.

Commission on Crystallographic Computing

The year opened with the Winter School in Crystallographic Computing held at the Indian Institute of Science in Bangalore, 4–14 January. This event provided lectures and tuition for some 144 students from 19 countries mostly from countries bordering the Indian Ocean but some from further afield. The lectures and much of the examples-class material from this school have now been collected into a book entitled *Computing in Crystallography* which has been published by the Indian Academy of Sciences for the International Union of Crystallography. It is priced at \$8 to individuals or \$17 to libraries and institutions, and is referred to in *Acta Cryst.* (1980), A36, 1090 as 'most useful to all who are engaged in crystal structure determination'. A fuller review is to appear in *Acta Cryst.* Section A during 1981 [*Acta Cryst.* (1981), A37, 446].

During 1979 David Sayre, at the invitation of the Organizing Committee of the XIIth Congress, embarked on the organization of the computing school to be held 7–15 August 1981 at Carleton University. Although this is not

formally an activity of the Commission, the Commission has played a supporting role in assisting Dr Sayre with programme planning, and it might have done more had it not been preoccupied with the Bangalore School during 1979. The Commission was also active in 1980 in planning two Open Sessions at the XIIth Congress.

A working party of the Commission and the Commission on Crystallographic Data has been preparing proposals for a crystallographic data format to be recommended for exchanges between laboratories and for publishing purposes. This working party, led by I. D. Brown, has been active during 1980 and expects to report to the XIIth Congress.

Commission on Crystallographic Data

1. *Bibliography of Mathematical Crystallography*. It has been decided to print this as a supplementary publication and, in all probability, a short communication or note will appear in *Acta Crystallographica* announcing its availability. Since the deadline has been relaxed the bibliography will now contain additional material for 1979–80.

2. *Standard Crystallographic File Structure*. Further refinement and suggestions have been made and it is expected that a 'final' draft will be issued very soon in time for presentation at the XIIth IUCr Congress.

3. *Standards for the Publication of Powder Patterns*. This report, prepared by an ACA sub-committee, was circulated to Commission members. It was approved although some people felt that an auxiliary one-page summary document would be useful. The full report has been published as *National Bureau of Standards Special Publication 567*. The Appendix to the report will be published in the Union journals and the availability of the NBS report will be announced [*Acta Cryst.* (1981), **A37**, 443–444; *J. Appl. Cryst.* (1981), **14**, 216–217].

4. *Open Commission Meetings at Ottawa*. A very considerable effort has been expended in the organization of two open meetings of the Commission at the XIIth Congress in Ottawa. This has resulted in the following two scheduled sessions: (a) Data Bases and Data Centres; (b) Powder Data Collection and Analysis. The latter has been organized by Professor S. Weissmann on behalf of the JCPDS.

5. *Topics for Discussion*. On the occasion of the Sixth European Crystallographic Meeting there was an opportunity for a few members of the Commission to meet. At that time, and later by correspondence, a number of items were proposed as topics for consideration by the Commission. They include SI units, keywords for data in abstracts, accuracy of data, data deposition in relation to the primary journals, and assignments of phase designations in metallic systems. It has also been suggested that, during the XIIth Congress, an *ad hoc* session might usefully be convened of producers of data bases. The time is probably ripe for an exchange of ideas in this area.

Commission on Crystallographic Nomenclature

The second of two *ad hoc* committees, established under ground rules outlined in *Acta Cryst.* (1979), **A35**, 1072, was appointed. The *ad hoc* Committee on the Nomenclature of Symmetry has been constituted with P. M. de Wolff as Chairman, N. V. Belov, E. F. Bertaut, M. J. Buerger, J. D. H. Donnay, W. Fischer, Th. Hahn, V. A. Koptsik and A. L.

Mackay as members, and the chairman of the Commission as an *ex officio* member.

The *ad hoc* Committee on the Nomenclature of Disordered, Modulated and Polytype Structures, with membership as given in *Acta Cryst.* (1980), **A36**, 1077, concentrated its work this year on the problem of polytype structure nomenclature.

Commission on Crystallographic Studies at Controlled Pressures and Temperatures

The study of the reproducibility of the semiconductor-conductor transformation in GaAs, which occurs in the region 18.0–19.3 GPa (180–193 kbar) according to previous investigations, was carried out. GaAs was chosen because the transition can be observed by several means including X-ray diffraction and optical and electrical measurements. A high-purity, non-doped single crystal of GaAs was sectioned and distributed to more than ten laboratories. Both the diamond-anvil cell and the multi-anvil-type high-pressure apparatus were used for the present study. The results are being analysed and will be reported at an Open Commission Meeting during the XIIth Congress.

Commission on Crystallographic Teaching

The Commission organized an Open Session at the Sixth European Crystallographic Meeting in Barcelona in 1980, where animated discussions took place. It also held a closed meeting which was attended by nine members and consultants.

A Spring School on New Crystallographic Perspectives in Material Sciences was held in Erice in April 1980 and met with great success. It was attended by 99 participants. Discussions are under way for the next Summer School on The Teaching of Crystallography. Two possible locations are being considered, in Latin-America (Brasilia) and in South East Asia (Malaysia). Plans are also being made for a Course on the Repair and Maintenance of Crystallographic Apparatus.

The first set of ten pamphlets in the Pamphlet Project will be published in 1981, and the next set is under preparation. The Commission is preparing a list of books of interest for the teaching of crystallography.

Commission on Electron Diffraction

The current projects of the Commission include the following items. For details of each item see the Commission report for 1979 [*Acta Cryst.* (1980), **A36**, 1077].

1. *Preparation of a Book Entitled Fifty Years of Electron Diffraction*. All the manuscripts were collected and edited by P. Goodman. They were sent to Reidel Publishing Company at the end of October 1980. The book is expected to have about 450 pages and to appear in the summer of 1981.

2. *Space Group Project*. A list of the substances studied in the laboratories at Bristol, Clayton, and Sendai (at least 25 space groups distributed over six crystal systems) was compiled by L. Kihlberg in October 1980. He also prepared a schedule for the project, with the aim of publishing a report on the project.

3. *Gas Electron Diffraction Information Service Project*. The fourth issue (January 1980, 29 pages) and the fifth issue

(August 1980, 20 pages), organized by K. Hedberg and compiled by B. Starck, were distributed.

4. *Organization of an Open Commission Session.* The Commission is organizing a microsposium on gas electron diffraction at the XIIth Congress in Ottawa.

Commission on Neutron Diffraction

The main activity of the Commission in the past year has revolved around the forthcoming Congress in Ottawa and the associated Neutron Scattering Symposium at Argonne National Laboratory during the preceding week, from 12 to 14 August. The latter is perhaps the most ambitious project undertaken by the Commission to date, and will include five plenary sessions with an international list of invited speakers in the areas of pulsed-neutron research, instrumentation and techniques, small-angle scattering, magnetic scattering and disordered solids. In addition to this, there will be two microsypmosia arranged by the Commission during the Congress, on phase transitions and incommensurate structures, and on monolayers and intercalated compounds, in which some emphasis will be given to the physical aspects of these systems.

The other activities of the Commission are progressing rather slowly. A progress report on the compilation of coherent and absorption cross sections will be given at the Argonne meeting, together with the status of the profile refinement intercomparison project. A questionnaire on diffractometers and software was sent out by M. S. Lehmann and H. Dachs, and replies to this will be summarized and distributed to neutron diffractionists in due course. There is no further activity to report for the *Magnetic Structure Data Sheets* and the *Neutron Diffraction Newsletter* during the current period.

Sub-Committee on the Union Calendar

The Sub-Committee receives and considers requests for Union sponsorship and nominal financial support, and makes recommendations to the Executive Committee. Acting on the recommendations made by the Sub-Committee, during 1980 the Executive Committee approved sponsorship of, and usually financial support to, meetings and schools listed below. It also approved financial support to the XIIth International Congress at Crystallography.

1. Sixth International Conference on Crystal Growth (Moscow, USSR, 10–16 September 1980).
2. Fourth International Specialist's School on Crystal Growth (Susdal, USSR, 17–25 September 1980).
3. Applications of the Mössbauer Effect (Srinivar, India, 13–17 July 1981).
4. International Summer School on Crystallographic Computing (Ottawa, Canada, 7–15 August 1981).
5. Neutron Diffraction Conference (Argonne, USA, 12–13 August 1981).
6. Symposium on Crystallography in the Health Sciences; Crystalline Deposits in Human Tissues (Toronto, Canada, 13–14 August 1981).
7. Symposium on Biologically Active Molecules (Buffalo, USA, 26–28 August 1981).
8. International School on Synthesis, Crystal Growth and Characterization of Materials for Energy Conversion and Storage (New Delhi, India, 12–23 October 1981).

9. Workshop on the Crystallography of Molecular Biology (Erice, Italy, 7–29 June 1982).

10. Sagamore VII Conference on Charge, Spin and Momentum Densities (Nikko Kanayo Hotel, Japan, 25–30 August 1982).

Other meetings held in 1980 which received Union support are included in the list at the beginning of the Report of the Executive Committee, under the heading *Meetings*. Organizers of meetings wishing to seek Union sponsorship should write, as early as possible, to the Chairman of the Sub-Committee, Professor Th. Hahn, Institut für Kristallographie der Technische Hochschule, Templergraben 55, 51 Aachen, Federal Republic of Germany.

Representatives on Other Bodies

Abstracting Board of the International Council of Scientific Unions (ICSU AB)

The Abstracting Board held a series of meetings in Sevilla from 24 May to 29 May 1980. There were no candidates for membership, though observers from two or three possible new members were present.

One of the major items of business at the General Assembly was revision of the Statutes. Although the Board had been led to believe, from 1971 onwards, that it was incorporated in Switzerland, the transfer had not in fact taken place, and its incorporation in Belgium had not been revoked. Certain statutes purporting to deal with incorporation in Switzerland were, therefore, invalid, and those that they purported to replace were still in force. The General Assembly adopted several revised statutes, the chief effect of which was to create three new honorary officers (Vice-President, General Secretary, and Treasurer), and to change the title of the paid official from 'General Secretary' to 'Executive Secretary'. The IUCr representative was elected as Vice-President. The rest of the business of the General Assembly was mainly the receipt of reports from various committees. The finances of the Board were likely to be satisfactory for 1980 and 1981, but there would be serious and increasing deficits from 1983 onwards unless the dues were revised upwards.

As a result of a suggestion from the US National Committee for ICSU AB, a meeting of the representatives of the Unions and ICSU took place. During recent years the Board had concerned itself largely with commercial and technical problems, and the interests of the working scientists had become secondary. The meeting made several suggestions for redressing the imbalance, and these were accepted in principle and some have been implemented.

There will be a meeting of the Full Board in Georgia, USA, in May–June 1981, and it is expected that they will include a meeting of representatives of the Unions and ICSU.

Committee on Data for Science and Technology (CODATA) of the International Council of Scientific Unions

A major CODATA activity in 1980 was the International Conference and associated General Assembly held in Kyoto, Japan in October. For the first time at a CODATA Conference poster sessions were used, and this technique was very successful. Japanese crystallographers participated in these sessions and there were some very impressive demonstrations of the use of the Cambridge Data Base and the

Protein Data Bank. This work is centred on the Universities of Tokyo, Osaka and Kyoto.

Of special interest to the Union's representative was the effort being made by the Kyoto group to collect from Japanese authors atomic coordinates for 'old' structures which had been published without these data. The data thus collected have been processed and are now available for input to the Cambridge Data Base. This approach, on a national basis, could be adopted in other countries, especially if there are problems of communication.

In the course of the above work a standard format for crystal structure data has been devised and this work should be taken into account by the IUCr Working Party which is addressing this problem. At the same time interesting statistics have been collected on data errors.

Another topic which was of concern to everyone was the copyright situation as it relates to data bases, and also to computer software. Whereas the latter has received considerable attention and publicity, the problems associated with data bases seem to be largely unresolved. The Union's representative considers that the relevant IUCr Commissions, especially those on Journals, Crystallographic Data and Crystallographic Computing, should attempt to monitor this important area since the legal profession's understanding of the interface between publications and data banks appears to be rather rudimentary.

Throughout 1980 the Task Group and publication activities of CODATA have continued to show healthy progress. Another area of development for CODATA is the organization of training courses in data evaluation, data dissemination, etc., and two such courses were held in 1980.

Committee on Space Research (COSPAR) of the International Council of Scientific Unions

COSPAR is following a drastic programme of reorganization, from both the scientific and the administrative point of view. At the last annual meeting in Budapest, 5–14 April, an excellent scientific programme was presented by the Interdisciplinary Commission G on Materials Science in Space. Reports of the Kosmos programme, a collaboration in scientific space activities between the USSR and East European countries, included the study of the growth by sublimation of lead chalcogenides, an important group of IR-active materials, and the chemical transport of germanium. An excellent study of dendritic growth from the melt at very high crystallization velocities was reported from the USA. Unfortunately the Spacelab mission has been postponed again, until May 1983. Only then will the feedback from the enormous efforts of the European Space Agency countries in materials science in space become available.

A Symposium on Fundamental Aspects of Materials Science in Space is planned for the next COSPAR meeting in Ottawa in May 1981.

Committee on the Teaching of Science of the International Council of Scientific Unions

The Committee met in Malvern, England, in March, and was represented at the Fourth International Congress on Mathematical Education in Berkeley, California, USA, in August, and at the 18th ICSU General Assembly in

Amsterdam in September. One of the main activities of the Committee has been the discussion of the interaction of mathematics with other sciences at various levels. Joint seminars and workshops will be organized in 1981.

Committee on Science and Technology in Developing Countries (COSTED) of the International Council of Scientific Unions

COSTED provides some financial support to scientists from developing countries in order to help them attend scientific meetings or schools. The lack of communication between COSTED and the various Unions belonging to ICSU was stressed by many representatives at the meeting of the General Committee of COSTED, which was held in Amsterdam in September 1980 and was attended by several representatives from the IUCr.

Scientific Committee on Problems of the Environment (SCOPE) of the International Council of Scientific Unions

The SCOPE Executive Committee held an open meeting in Brussels, 15–16 September 1980, with the Chairmen of National Committees and representatives of participating Unions and Committees of ICSU. In total, there were 55 participants at the meeting with representatives from 21 National Committees and six ICSU Unions and Committees.

The Executive Committee reviewed the on-going SCOPE projects of the global biogeochemical cycles, processes of land transformation and ecotoxicology. On the basis of this review, the SCOPE programme was finalized for the period up until the Vth General Assembly, which is scheduled for 25–28 May 1982 in Ottawa, Canada. During the Open Meeting reports of ecological effects of fire, freshwater wetlands and shallow water bodies, safety evaluation of chemicals and climate impact assessment were presented. *Ad hoc* working groups were established for critical evaluation of the different projects, and the reports of these groups were presented during the meeting.

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

During 1980 the members of the Commission discussed the future work of the Commission, particularly concerning those aspects of the physics of condensed matter not covered by the IUPAP Commissions on Semiconductors, Magnetism and Low Temperature Physics. Together with various other proposals it was recommended that the Commission should direct its interests towards the field of 'Structure and Dynamics of Condensed Matter'. This is a relatively broad area of solid-state physics which, in many cases, overlaps with some topics currently included in the programmes of meetings sponsored by the IUCr. A list of experts active in 'Structure and Dynamics of Condensed Matter' was compiled for proposed membership of the Commission. A list of international conferences which were proposed and recommended for 1981 was compiled.

Conference Committee of the European Physical Society

The Union representative attended two meetings of the Committee during 1980. The main points discussed were (1)

the reasons for poor attendance of members at meetings of the Committee, (2) applications for sponsorship or approval received from the organizers of physics conferences, (3) preparations for the EPS General Conference in 1981, (4) preparation and discussion of the brochure 'Guidelines for Conference Organizers', and (5) *Europhysics Conference Abstracts*.

The Union representative has kept the IUCr Calendar Sub-committee informed of all matters concerning sponsorship of meetings by the EPS, and has forwarded information on future physics conferences in Europe for inclusion in the Forthcoming Meetings section in the *Journal of Applied Crystallography*.

International Organization for Crystal Growth

The 6th International Conference on Crystal Growth (ICCG-6) was held in Moscow, 10–16 September 1980. The interdisciplinary character of the conference was clearly demonstrated by the fact that the local scientific and organization committees were recruited from the staff of the Institutes of Crystallography (IKAN), Physics, and Solid State Physics of the Academy of Sciences in Moscow. The 1400 participants included approximately 300 from outside the USSR. The excellent scientific programme illustrated the enormous effort of the USSR in material sciences, where crystallography is playing a leading role in the fields of fundamental research and applied science, including the production of high-quality crystal growth and X-ray equipment by IKAN. A series of interesting lectures from abroad illustrated the progress in fundamental and applied fields outside the USSR.

The conference was followed by a Specialists School, organized by the Institute of Solid Physics of the Academy of Sciences. The School gave an excellent cross section in the fields of materials science, surface physics and crystal growth.

The 7th International Conference on Crystal Growth will be held in Stuttgart and a summer school will be held in Switzerland in September 1983.

European Crystallographic Committee

The Union representative attended the meetings of the European Crystallographic Committee held on 29 and 31 July 1980 during the Sixth European Crystallographic Meeting in Barcelona. The representative's role at the meetings was to be responsive to matters that concerned the affiliation of the European Crystallographic Committee with the IUCr. His duties also included the making of a report to the IUCr Executive Committee concerning main agenda items of the ECC meetings and future plans, particularly with regard to forthcoming meetings. The Seventh European Crystallographic Meeting will take place in Jerusalem, Israel, 29 August–3 September 1982. It is planned to hold the Eighth European Crystallographic meeting in Liège, Belgium, in August 1983. No substantive issues concerning the affiliation of the European Crystallographic Committee with the IUCr arose.

International Council of Scientific Unions

The President represented the Union at the meetings of the ICSU General Committee and General Assembly held in Amsterdam in September 1980. The Executive Secretary also attended the General Assembly.

The General Assembly (1) accepted the Royal Scientific Society of Jordan and the Kenya Academy for the Advancement of Arts and Sciences as National Members; (2) supported an assessment of the problems of nuclear waste disposal; (3) invited National Agencies to consider the continued modernization of data-handling facilities in the world Data Centres; (4) endorsed the establishment of an Inter-Union Commission on the Lithosphere; (5) received the report of the Inter-Union Commission on the Application of Science to Agriculture, Forestry and Aquaculture, and supported further work in this field; (6) asked the Executive Board to consider ways of increasing the involvement of the international scientific community in the problems of the developing countries; (7) recommended the establishment of one or more international centres for tropical forestry research in Asia, Africa and Latin America; (8) endorsed the programme of the International Biosciences Network in fostering biological training and research in developing countries; (9) asked the ICSU officers to discuss with Unesco support for the oceanographic aspects of the World Climate Programme. The application from the People's Republic of China was withdrawn at the last minute. Proposals to change the representation and voting power of the Unions in ICSU, by forming 'super unions' or by grouping the Unions into three clusters to represent the physical, biological and earth/space sciences, were not acceptable to most Unions. The Executive Board will continue its attempts to find a solution which is acceptable to the General Assembly. A new system of allocating the Unesco subvention to the Unions will be introduced from 1982. The IUCr will receive a slightly smaller allocation than under the present system.

The IUCr submitted to ICSU a proposal for inclusion in the Unesco Medium Plan for 1984–89, for the establishment of an International Institute for Crystallography in a developing country.

Finances

The audited accounts for the year 1980 are given at the end of this Report. For comparison, the figures for 1979 are provided in italics. Negative quantities are indicated by parentheses.

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 US dollars at 31 December 1980 have been translated into US dollars in the Balance Sheet at the rate operative at that date. For the Income and Expenditure Accounts, transactions have been translated into US dollars by applying the rates of exchange appropriate to the individual dates of these transactions. As a consequence of the fluctuations in exchange rates, a deficit has arisen on the

assets of the Union, in terms of US dollars, amounting to \$52 769. This deficit has been divided amongst the nine Fund Accounts with credit balances, in direct proportion to the balances on these accounts at 31 December 1980.

The General Fund account shows a deficit of \$1562 as compared with a surplus of \$29 433 in 1979. The administrative expenses were \$76 472 in 1980 as compared with \$63 875 in 1979. Of this amount, \$23 775 was charged to the publications of the Union. \$16 280 was spent on supporting scientific meetings, whilst \$4720 was required for travel expenses of Union Representatives on other bodies. The Executive Committee meeting cost \$13 531. The Union received \$8000 from the Unesco subvention to ICSU and a grant of a further \$5000 from ICSU. The subscriptions from Adhering Bodies totalled \$44 400.

Investments of Swiss F 170 000 were purchased during the year, and the income from investments rose to \$45 530 as compared with \$36 761 in 1979. Interest from banking accounts rose to \$7026, whilst a gain of \$901 arose from the redemption of Dfl 20 000 and \$5000 of investments during 1980.

In preparation for the establishment of the in-house computerized typesetting facility investments with a nominal value of £30 000 were sold in December 1980, leading to a loss of \$14 333 compared with the dollar equivalent of their cost when these investments were purchased in 1972. Nearly all the remainder of the Union's investments were sold early in 1981, and the proceeds were placed on deposit terms in sterling. The sale proceeds exceeded cost and did not differ significantly from the market value noted in the Balance Sheet for 1980.

The President's Fund account received \$489 in donations during 1980; no travel grants were made from the fund.

The *Acta Crystallographica* account for 1980 shows a deficit of \$168 458 as compared with a surplus of \$1926 in 1979. The subscription rates were increased by about 10% in 1980. This deficit resulted from a 20% increase in the publication expenses in sterling, which was higher than had been estimated when the subscription rates were determined in mid 1979, a substantial increase in the value of sterling with respect to the Danish kroner, the currency in which the subscription income is received, and a small increase in the number of pages published during the year.

The number of paid subscriptions to both sections of the journals dropped from 1453 in 1979 to 1418 in 1980, including 152 personal subscriptions in 1979 and 150 in 1980. There were also 250 paid subscriptions to Section A and 137 paid subscriptions to Section B in 1980, compared with 253 and 131 respectively in 1979. The cost of assessment of the computerized typesetting facility and the cost of the technical editing office have 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; 87% and 13% respectively for 1980. The technical editing costs for *Acta Crystallographica* were \$129 905 in 1980 as compared with \$108 477 in 1979. In 1979 the cost included \$11 887 for renovation and refurbishing the new offices in Chester. The increase in costs is attributable to inflation and the increase in the value of sterling with respect to the US dollar. The journals 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 deficit of \$17 848 as compared with a deficit of \$2996 in 1979. The subscription rates were increased by 10% for 1980. The number of paid subscriptions decreased slightly from 1180 in 1979 to 1168 in 1980, including 107 personal subscriptions in 1979 and 102 in 1980.

The *Structure Reports* account shows a deficit of \$17 221 as compared with a surplus of \$30 992 in 1979. Publishing and editorial expenses in 1980 were \$30 945 and \$58 543 respectively, as compared with \$36 831 and \$20 570 in 1979. The large increase in editorial expenses resulted from a 25% increase in the level of editorial honoraria, the first increase for many years, and the payment of honoraria for two annual B volumes, as well as one A volume, during 1980. The net income from sales was \$72 267 in 1980 as compared with \$92 053 in 1979. This reduction in sales income was the result of a substantial number of standing orders not being received until after the end of the year and also the higher commission being paid to the new publisher of *Structure Reports*.

The *International Tables* account shows a surplus of \$6736 as compared with a surplus of \$7345 in 1979. Publication expenses of \$4203 were incurred in 1980 in connection with the present series of *International Tables*, and the net sales income from this series was \$13 404. The expenses for the new volume on direct space were \$2465, including the preparation of artwork and general editorial expenses.

\$291 was received from the sale of 27 copies of *Fifty Years of X-ray Diffraction*. \$1002 was received from the sale of 92 copies of *Symmetry Aspects of M. C. Escher's Periodic Drawings*, as well as \$457 royalties for the North American and Japanese editions of this book. \$433 was received from the sale of 23 copies of Volume I and 24 copies of Volume II of *Early Papers on Diffraction of X-rays by Crystals*, reducing the deficit on this fund account to \$6704.

The *Molecular Structures and Dimensions* account shows no surplus for 1980, because this account was charged with a contribution of \$15 336 towards the publication costs of Volume 11, the volume published in 1980. The sales income was only \$16 161 in 1980 because payment for many standing orders was outstanding at the end of the year, and there was an increase in the commission paid to the publisher. Only 275 copies of Volume 11 were sold in 1980, as compared with 445 copies of Volume 9 and 428 copies of Volume 10 in 1979.

As on previous Balance Sheets, the investments have been valued according to their quotations at the end of the year. Their appreciation in value, together amounting to \$27 158, has not been entered in the General Fund but has again been included in the assets on the Balance Sheet, to avoid annual fluctuations in value influencing the General Fund Account. At the end of 1980 the Union held investments in government bonds with a total maturity value of Dfl 294 000, plus \$40 000, plus DM 451 000, plus Swiss F 328 000, although all these investments except Swiss F 18 000 were sold early in 1981.

The total of \$64 804 with the banks at the end of the year was represented by Dfl 8444 and \$5620 with the Amsterdam-Rotterdam Bank, \$13 046 with the Bankers Trust Company, £14 190 with the National Westminster Bank, Swiss F 14 202 with the Union Bank of Switzerland and Dkr 1794 with the Handelsbanken i Aarhus. The

amounts shown in the Balance Sheet for debtors and creditors relate to sums, principally on the publishing accounts and the sale of the sterling investments, due at 31 December 1980. Where appropriate, these amounts have now been settled.

The Balance Sheet shows that the assets of the Union, excluding stocks of unsold publications but including the loss of \$52 769 resulting from fluctuations in rates of exchange, have decreased during the year, from \$838 553 to \$590 103.

International Union of Crystallography Balance Sheet as at 31 December 1980

	US Dollars		US Dollars	
	1980		1980	1979
	As at 31 December 1979	Loss on fluctuations in rates of exchange	Excess of expenditure over income for the year	Balance at 31 December 1980
				1979
FUND ACCOUNTS				
General Fund	169,898	(13,071)	(1,562)	169,898
President's Fund	4,284	(371)	489	4,284
<i>Acta Crystallographica Journal of Applied Crystallography</i>	400,020	(17,980)	(168,458)	400,020
<i>Structure Reports International Tables</i>	69,583	(4,017)	(17,848)	69,583
General Publications	161,282	(11,186)	(17,221)	161,282
<i>Fifty Years of X-ray Diffraction</i>	(36,751)	—	6,736	(36,751)
<i>Escher Drawings Early Papers</i>	58,166	(4,517)	—	58,166
<i>Molecular Structures and Dimensions</i>	2,633	(227)	291	2,633
	11,267	(988)	1,459	11,267
	(7,137)	—	433	(7,137)
	5,308	(412)	—	5,308
	<u>\$838,553</u>	<u>\$(52,769)</u>	<u>\$(195,681)</u>	<u>\$590,103</u>
	Investments	(49,353)		
	Others	(3,416)		
		<u>(52,769)</u>		<u>\$838,553</u>
CURRENT ASSETS				
Cash at Banks				
Current Accounts	29,690			70,107
Deposit and Savings Account	35,114			60,113
				<u>130,220</u>
Cash with Union Officials	7,138			930
Debtors	130,905			225,407
Subscriptions from Adhering Bodies, due for 1979 to 1981	5,180			580
				<u>208,027</u>
<i>Deduct Creditors</i>	208,027			357,137
	151,018			95,224
				<u>57,009</u>
NET CURRENT ASSETS				
				<u>57,009</u>
FIXED ASSETS				
Investments				
At market value	555,001			586,155
Appreciation in value	(27,158)			(16,537)
				<u>527,843</u>
Office Equipment at cost, less depreciation	5,251			7,022
				<u>533,094</u>
TOTAL FIXED ASSETS				
				<u>533,094</u>
				<u>\$590,103</u>
				<u>\$838,553</u>

Report of the Auditors to the International Union of Crystallography

We have audited the financial statements on pages 934 to 941 in accordance with approved Auditing Standards.

In our opinion, the financial statements give a true and fair view of the state of affairs at 31 December 1980 and of its excess of expenditure over income and application of funds for the year then ended.

Manchester, England
27 May 1981

Signed: TOUCHE ROSS & Co.

Chartered Accountants

General Fund Account for the year ended 31 December 1980

	US Dollars	
	1980	1979
Subscriptions to ICSU (2½% of subscriptions received from Adhering Bodies in 1979)	1,091	821
Subscription to ICSU Abstracting Board	360	360
Subscription to ICSU Committee on the Teaching of Science	400	300
Administration Expenses:		
Honoraria: General Secretary, Treasurer and Secretarial Assistance	1,695	2,193
Audit and Accountancy Charges	5,189	4,503
Taxation and other services	2,139	548
Legal Fees	667	727
Postages, Stationery, Printing and Sundries	1,300	1,646
Travelling Expenses	1,876	1,888
Bank Charges	1,329	987
Executive Secretary's Office: Salaries and Expenses	61,236	45,789
Renovation and Refurbishing of Premises	-	4,555
Depreciation of Office Equipment	1,041	1,039
Eleventh General Assembly and Congress: Publication of Report	-	5,496
Twelfth General Assembly and Congress: Meeting of the Programme Committee	9,268	9,268
Meeting of the Executive Committee	13,531	10,371
Travel Expenses of IUCr Representatives on Other Bodies	4,720	2,650
Expenses on Commissions	-	7,037
Sponsorship of Meetings	16,280	1,000
Travel Grants	-	2,000
Distribution Costs of the Proceedings of the Madrid Conference on Anomalous Scattering	-	283
	<u>\$122,122</u>	<u>\$94,193</u>
	<u>\$122,122</u>	<u>\$94,193</u>
Grant received from Unesco Subvention to ICSU	8,000	6,000
Grant received from ICSU	5,000	-
Unesco Contract for Pamphlets Project	-	4,000
Subscriptions from Adhering Bodies	44,400	44,400
Interest on Investments	45,530	36,761
Interest on Banking Accounts	7,026	6,921
Profit on Redemption of Investments	901	2,310
Loss on Sale of Investments	(14,333)	-
Donation	-	2,500
Net sale of <i>World Directory of Crystallographers</i> : 5th Edition	147	842
Net sale of the Proceedings of the Madrid Conference on Anomalous Scattering	32	34
Net Sale of Sundry Publications (Bibliographies, <i>Book List, List of Computer Programs and Index of Crystallographic Supplies</i>)	82	-
Amount charged to Journals and Publications:		
<i>Acta Crystallographica</i>	17,200	14,400
<i>Journal of Applied Crystallography</i>	5,750	4,800
<i>Molecular Structures and Dimensions</i>	825	658
	<u>23,775</u>	<u>19,858</u>
Excess of Expenditure over Income Carried to Balance Sheet	1,562	(29,433)

Structure Reports Account for the year ended 31 December 1980

	US Dollars	
	1980	1979
Publication Expenses: Printing and Binding Volumes 43B and 44A (1979 Volumes 42B and 43A)	27,826	34,297
Typing of Manuscripts	3,119	30,945
	<u>30,945</u>	<u>2,534</u>
Cost of transferring stocks to new publisher	-	3,660
Editorial Expenses: Salary and Honoraria: Editors, Abstractors and Assistants	58,543	20,570
	<u>\$89,488</u>	<u>\$61,061</u>
	76,112	87,188
Sale of Copies of Volumes 43B and 44A (1979 Volumes 42B and 43A) Earlier Volumes and Indexes	<u>22,832</u>	<u>24,400</u>
	98,944	111,588
Less Publisher's Commission on Sales	<u>26,677</u>	<u>19,535</u>
	72,267	92,053
Excess of Expenditure over Income carried to Balance Sheet	17,221	(30,992)
	<u>\$89,488</u>	<u>\$61,061</u>

International Tables Account for the year ended 31 December 1980

	US Dollars	
	1980	1979
Publication Expenses: Binding Volume IV	4,203	-
Artwork for Volume on Direct Space	1,150	3,892
	<u>5,353</u>	<u>3,892</u>
Editorial Expenses: Secretarial Assistance and Postages Travelling	1,253	905
	<u>62</u>	<u>1,963</u>
	1,315	2,868
Computer Trial Project: Travelling and Miscellaneous Expenses Excess of Income over Expenditure carried to Balance Sheet	-	77
	6,736	7,345
	<u>\$13,404</u>	<u>\$14,182</u>
	19,097	20,206
Sale of Copies of Volumes, I, II, III, and IV Less Publisher's Commission on Sales	<u>5,693</u>	<u>6,024</u>
	13,404	14,182
	<u>\$13,404</u>	<u>\$14,182</u>

Fifty Years of X-ray Diffraction Account for the year ended 31 December 1980

	US Dollars	
	1980	1979
Excess of Income over Expenditure carried to Balance Sheet		
	291	102
	<u>\$291</u>	<u>\$102</u>
	416	127
	125	25
	<u>\$291</u>	<u>\$102</u>

Escher Drawings Account for the year ended 31 December 1980

	US Dollars	
	1980	1979
Excess of Income over Expenditure carried to Balance Sheet		
	1,459	1,204
	<u>\$1,459</u>	<u>\$1,204</u>
	1,431	1,090
	429	218
	<u>\$1,459</u>	<u>\$1,204</u>

Early Papers Account for the year ended 31 December 1980

	US Dollars	
	1980	1979
Excess of Income over Expenditure carried to Balance Sheet		
	433	424
	<u>\$433</u>	<u>\$424</u>
	618	530
	185	106
	<u>\$433</u>	<u>\$424</u>

Molecular Structures and Dimensions Account for the year ended 31 December 1980

	US Dollars	
	1980	1979
Publication Expenses:		
Printing and Binding Volume 11 (1979 Volume 10)	8,414	8,645
Carriage and Miscellaneous Expenses	1,150	483
Salaries	5,772	8,752
Administration Expenses		
Excess of Income over Expenditure for the year:	825	1,316
University of Cambridge	—	22,965
IUCr carried to Balance Sheet	—	1,209
	<u>\$16,161</u>	<u>\$43,370</u>
	11,440	39,213
	10,994	13,357
	22,434	52,570
	6,273	9,200
	<u>\$16,161</u>	<u>\$43,370</u>

Statement of Source and Application of Funds

Year ended 31 December 1980

	<i>US Dollars</i>	
	1980	1979
Source of funds		
(Excess of expenditure over income)/excess of income over expenditure for the year	(195,681)	70,009
(Loss)/profit on fluctuations in rate of exchange	(52,769)	25,808
	<hr/>	<hr/>
	(248,450)	95,817
Adjustment for items not involving the movement of funds:		
Depreciation	2,478	2,381
Loss on sale of investments	14,333	-
Profit on redemption of investments	(901)	(2,310)
Loss/(profit) on fluctuations in rates of exchange on investments	49,353	(5,172)
Profit on fluctuations in rates of exchange on office equipment	(421)	(854)
	<hr/>	<hr/>
Total (absorbed)/generated from operations	(183,608)	89,862
Proceeds of sale investments	52,987	-
Proceeds of redemption of investments	15,126	23,970
Increase in creditors	55,794	26,304
Decrease in debtors	89,902	52,898
	<hr/>	<hr/>
	30,201	193,034
Application of funds		
Purchase of investments	(89,123)	(254,674)
Purchase of office equipment	(286)	(2,464)
	<hr/>	<hr/>
Decrease in net liquid funds	(59,208)	(64,104)
	<hr/> <hr/>	<hr/> <hr/>

Net liquid funds include cash at banks and with Union officials.

Notes to the Financial Statements

1. Accounting Policies

(a) The financial statements have been 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 US Dollars at the Balance Sheet date are translated into US Dollars at the rates operative on that date.

In each of the Income and Expenditure Accounts, transactions in currencies other than US Dollars 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 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) Investments are included in the Balance Sheet at market value. Depreciation or appreciation, calculated as the difference between cost and market value, is added or deducted to bring the Investments back to cost to prevent the fluctuation in value from influencing the General Fund.

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

2. Rates of Exchange

The rates of exchange operative at the Balance Sheet date compared with the US Dollar were as follows:

	1980	1979
Netherland Guilders	2.08	1.94
Danish Crowns	5.90	5.32
Pounds Sterling	0.424	0.456
Swiss Francs	1.71	1.60
German Marks	1.91	1.74

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, income arising within the United Kingdom under present circumstances will not be subject to United Kingdom Tax.

4. Post Balance Sheet Events

(a) Investments

Substantially the whole of the investments have been sold since the Balance Sheet date and the proceeds have been placed on deposit terms in sterling with National Westminster Bank Ltd, Manchester. The sale proceeds exceed cost and do not differ significantly from the market value noted in the Balance Sheet.

(b) Computerized Typesetting Facility

During the year under review the Union entered into negotiations for the purchase of a computerized phototypesetting system, the cost of this equipment, without taking account of accommodation, staff costs and ancillary items would be approximately £150,000 (\$353,774). The finalization of the contract is dependent largely on the conclusion of satisfactory arrangements for financing the purchase taking into account the working capital requirements of the Union.

If the project were to be discarded for financial or other reasons the Union may be involved in the write off of abortive post balance sheet expenditure of a significant amount, which it is not practicable to estimate.