
ISAC Report

A History of the International Society for Analytical Cytology

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FORMATION OF THE SOCIETY

In 1970, the Engineering Foundation of New York City sponsored and organized an International Research Conference on Engineering in Medicine: Automated Multiphasic Health Testing, in Davos, Switzerland. As part of this conference, Kendall Preston was asked to organize a workshop on the topic of automatic cytology. About a dozen scientists were asked to attend the workshop so that the Engineering Foundation could evaluate this new field as one that the Foundation might foster. The workshop was very successful and resulted in a call for the first conference on the subject, to be held in Henniker, New Hampshire. About 60 people from academia and industry with expertise in cytochemistry, biomedical imaging, and flow cytometry attended this conference. This highly diverse group discussed the fundamentals of automatic cytology and potential applications in cytogenetics, hematology, cell kinetics, cancer diagnosis, and neurology.

A second conference was organized for 1972 at Saxtons River, Vermont. At this conference it became clear that the field was going to expand rapidly, and a decision was made to continue the series with a standing organizing committee with rotating chairmanship and membership. During the fifth conference, held in Pensacola, Florida, December 12–17, 1976, the attendees agreed that the formation of a society would provide professional continuity to the field and promote the continuation of the very successful series of conferences. Subsequently, the Organizing Committee of the sixth conference (held in Schloss Elmau, Bavaria, Germany, 1978) was empowered to create the Society. At a meeting held in June, 1977, the Organizing Committee formed a Founding Executive Committee to focus the effort. This committee drafted the following statement of long-range purpose of the Society:

1. To promote research, development, and applications in analytical cytology. Analytical cytology is broadly defined as the characterization and measurement of cells and cellular constituents for biological, diagnostic, and therapeutic purposes. It embraces components of cytochemistry, cytophysics, anatomy, biology, physiology, pa-

thology, image analysis, instrumentation, clinical laboratory practice, and other subjects of relevance.

2. To facilitate integration of the many disciplines within analytical cytology.

3. To disseminate knowledge of analytical cytology.

4. To provide information and advice on those aspects of public policy that are concerned with analytical cytology.

The committee prepared a questionnaire asking for 1) confirmation of continued interest in founding the society, 2) a response to a proposed Constitution and Bylaws that was drafted by a constitution committee, and 3) suggestions for a slate of nominees to the Council should founding of the society be approved. The questionnaire was sent to attendees of the previous conferences on automated cytology. The results were very encouraging. Among the 187 people who responded to the questionnaire, all but 11 were in favor of founding and joining a Society for Analytical Cytology. A total of 126 persons approved the recommended Constitution and Bylaws and the proposed slate of nominees; however, 36 persons suggested changes to the Constitution and Bylaws, and 38 submitted additional nominations. Many of the comments made concerning the Constitution and Bylaws were incorporated into the final document. No additional nominee received more than two votes; the proposed slate was elected. The Officers and Councilors of the new Society were:

President—Mortimer L. Mendelsohn

President-Elect—Myron R. Melamed

Honorary Past President—Thomas M. Jovin

Secretary/Treasurer—L. Scott Cram

This paper is based largely on the minutes of the Secretary of the International Society for Analytical Cytology, proceedings of conferences and other meetings, personal correspondence among Officers of the Society, and discussions with charter members of the Society.

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Editor—Brian H. Mayall

Councilors—Peter H. Bartels, Paul Mullaney, Marvin A. Van Dilla, Mack J. Fulwyler, J.S. Ploem, Leon L. Wheeless, Klaus Goertler, James H. Tucker, Ian T. Young.

The results of the questionnaire were sent to potential members of the Society, along with an invitation to become a charter member. The Constitution and Bylaws were to be voted on at the Schloss Elmau conference in 1978. At the first Business Meeting of the Society (in Schloss Elmau), the members decided that a committee should be formed to review the Constitution and Bylaws and to submit by mail suggested changes to the membership. The revised Constitution and Bylaws would then be discussed at the next Business Meeting (in Asilomar, California, in 1979) and the final version submitted to the membership for approval by mail ballot. The proposed Constitution and Bylaws were approved by a wide margin and became official in early 1979. For tax and other purposes, the Society applied for and was granted on October 6, 1980, incorporation under the Non-Profit Corporation Act of the District of Columbia.

Planning for Automated Cytology VII was underway. The Council had decided to hold the first Society meeting under the sponsorship of the Engineering Foundation. This would also be the last conference sponsored by the Foundation; beginning with the Wentworth conference in 1981, the Society would sponsor and organize its own conferences.

MEMBERSHIP

By the end of the Schloss Elmau conference in 1978, the Society had 160 charter members. In January, 1979, the membership had increased to 254, and the Society was in full operation. Growth in membership, however, was slow. This troubled the Council, and action was taken to increase the visibility of the Society. A membership committee was formed, the list of members was distributed, and the members were asked to recruit actively. The general membership was asked to propose projects that the Society might participate in, such as workshops held in collaboration with other groups and societies, that would improve the visibility of the Society for Analytical Cytology (SAC). For example, the Council voted to cosponsor with the IEEE the meeting "Pattern Recognition of Biomedical Images" that was held in Munich in October, 1982.

Figure 1 shows the growth in membership of the Society. After a slow start, the Society experienced a net growth rate of about 200 members per year until 1991, when the number of U.S. members peaked. Since that time, the number of U.S. members has slowly decreased. However, the number of non-U.S. members has continued to increase, keeping the total number of members about constant at 1,800. Although the Society still admits approximately 350 new members per year, it loses about the same number, primarily as a result of members leaving the field of analytical cytology. Table 1 shows the geographical distribution of members in early 1979, 1988, and 1995.

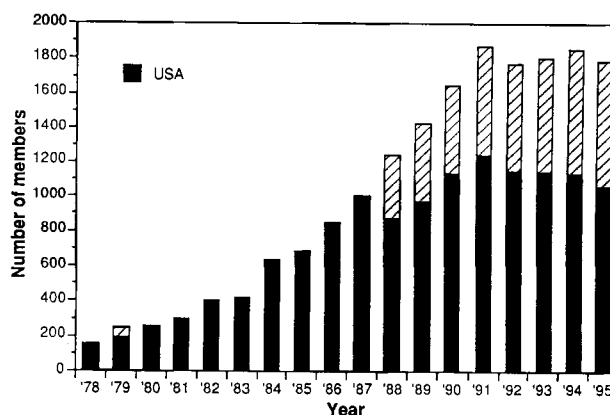


FIG. 1. Numbers of members from the founding of the Society in 1978 through 1995. The number of U.S. members is indicated by the shaded areas for the years 1979 and 1988–1995. The total number of members seems to have plateaued at about 1,800.

The number of countries with members in the Society has increased dramatically, from 14 in 1979 to 46 in 1995, making ISAC a truly international society.

MANAGEMENT OF THE SOCIETY

The Constitution and Bylaws are the ultimate authority for operation of the Society. The provisions of these documents are carried out by the Council, which is the next higher authority, and by the Officers. There are four Officers of the Society: President, President-Elect, Secretary, and Treasurer. The Council is composed of the Officers, nine Councilors, the Immediate Past-President, and one nonvoting member (the Editor of *Cytometry*). Under the original Constitution and Bylaws, the Officers served for one term each. A term is defined as the period of time between general meetings of the Society, typically 1.5 years. The Councilors served for three terms (about 4.5 years). When the Society was formed, the Secretary/Treasurer position was viewed as a long-time role, with the incumbent acting as the long-term memory of the Society. Scott Cram was the first person elected to this position and served as the Secretary/Treasurer until his election as President-Elect in 1985; James Jett was appointed to complete Cram's term of office. Jett was later elected to the position and held it until 1991. The modifications in the Constitution and Bylaws in 1991 separated the roles of Secretary and Treasurer, with Phillip Dean and Alan Landay taking over these roles, respectively. These Officers were elected to three-term periods of service. It was believed that this was a sufficient period of time to establish the continuity of Society memory. Under the policy established in 1994, i.e., holding the Society's Congress every 2 years, the periods of office for Secretary and Treasurer will be 6 years each. Since the formation of the Society, only one person has been a member of every Council: Brian Mayall, editor of the Society's journal, *Cytometry*.

The Council, under provisions of the Constitution, usually forms an Executive Committee composed of the Officers and the Immediate Past-President to manage the

Table 1
Membership Totals by Country in 1979, 1988, and 1995

Country	1979	1988	1995	Country	1979	1988	1995
Argentina			4	The Netherlands	8	30	44
Australia		30	66	New Zealand		2	7
Austria		2	10	Norway	2	10	17
Belgium		13	22	Philippines			1
Brazil			8	Poland			23
Bulgaria		1		Portugal		1	14
Canada	4	43	73	Puerto Rico		3	5
Chile			4	Romania			1
China (PRC)		5	6	Russia			4
Czechoslovakia		1		Saudi Arabia			2
Denmark	2	5	12	Singapore		1	4
Egypt		1	2	Slovakia			2
Finland		5	3	South Africa		1	9
France	1	51	62	Spain		7	38
Germany	18	44	68	Sultanate of Oman			1
Greece		2	7	Sweden	4	6	17
Hong Kong		2	11	Switzerland		4	15
Hungary	1	2	6	Taiwan		2	9
Israel	1	4	8	Thailand			1
Italy	5	22	65	Turkey			3
Japan	2	20	66	United Kingdom	6	46	75
Kenya			1	United States	197	876	1,124
Korea		5	7	Uruguay	1		1
Mexico			3	Venezuela			1

Society between Council meetings, which usually occur once per year. In addition, there are four standing committees with specific duties as established under the By-laws. The committees are: Membership Services, Finance, Nominating, and Scientific Advisory. The Council forms additional special committees to help it carry out its tasks. In 1992, a Policies and Procedures Manual, which lists all current policies as well as all past decisions of the Council, was prepared by the author for use by the Council. In 1994, the author also prepared a Duties and Responsibilities Manual to assist all Officers, Councilors, committee members, etc., in carrying out their duties. Both manuals are maintained by the Secretary of the Society. Table 2 gives a list of all Officers and Councilors holding office since the formation of the Society in 1978.

MEETINGS OF THE SOCIETY

Beginning with the conference held in Henniker, New Hampshire, in 1971, there have been a total of 16 conferences held under various names on the subject of automated cytology. The early conferences were managed by the Engineering Foundation and were called the Engineering Foundation Conferences on Automated Cytology. After the Society was formed and began to sponsor the conferences, they were called by various names, for example, "Automatic Cytology III," "Automated Cytology VII," "VIII Conference on Analytical Cytology and Cytometry," "Analytical Cytology X," and most recently "XVIII Congress of the International Society for Analytical Cytology," which was held in Rimini, Italy, in April, 1996 (see the Appendix and Table 3 for a list of the Engineering Foundation conferences and workshops on automated cytology, the SAC and ISAC conferences, conferences held in Europe in parallel with these conferences, associated conferences, and conferences that specialized in clinical

applications of the technology). Brief descriptions of most of the meetings are presented in the Appendix.

EXECUTIVE SECRETARY

As the Society grew, the workload of the Secretary/Treasurer's office grew accordingly. In addition, management of the Society's Congress became more of a burden to the President. In 1985, the firm of Parker and Parker was retained to assist in the management of the Society's next conference (1987, Cambridge, U.K.) and to assume management responsibilities for the following conference (1988, Breckenridge, Colorado). In 1988, Parker and Parker also assumed some of the clerical duties of the Secretary/Treasurer. Justine Parker became the Executive Secretary of the Society at the Breckenridge conference. In 1990, her title was changed to Executive Director. In general, the Executive Director prepares for the Council all business that has not been assigned to others. The Executive Director recommends plans of operation, conducts the general business of the Society under the guidance of Council, and prepares an annual report. Current duties of the Executive Director include maintenance of membership, financial, and business records as well as providing administrative and secretarial services to the members of Council. The Executive Director works with the President, Site Selection Committee, Local Arrangements Committee, and Scientific Program Chair to ensure the smooth conduct of the Society's Congress. Council determines other duties and responsibilities of the Executive Director as necessary.

REVISION OF THE CONSTITUTION AND BYLAWS

For the first 12 years of its existence, the principal focus of the Society was on its conferences, held about every 18 months, and on its publication, *Cytometry*. The

Table 2
Officers and Councilors of the (International) Society for Analytical Cytology^a

April 1978–November 1979			
Officers:	President: M. Mendelsohn President-Elect: M. Melamed	Secretary/Treasurer: S. Cram Past-President (Honorary): T. Jovin	
Councilors:	P. Mullaney M. Fulwyler I. Young	L. Wheelless M. Van Dilla J. Ploem	J. Tucker K. Goerttler P. Bartels
November 1979–May 1981			
Officers:	President: M. Melamed President-Elect: P. Mullaney	Secretary/Treasurer: S. Cram Past-President: M. Mendelsohn	
Councilors:	M. Fulwyler I. Young M. Ingram	M. Van Dilla J. Ploem S. Latt	K. Goerttler P. Bartels L. Ornstein
May 1981–October 1982			
Officers:	President: P. Mullaney ^b President-Elect: L. Wheelless	Secretary/Treasurer: S. Cram Past-President: M. Melamed	
Councilors:	I. Young M. Ingram L. Dethlefsen	J. Ploem S. Latt J. Watson	P. Bartels L. Ornstein G. Valet
October 1982–June 1984			
Officers:	President: L. Wheelless President-Elect: P. Horan	Secretary/Treasurer: S. Cram Past-President: ^c	
Councilors:	M. Ingram L. Dethlefsen J. Jett	S. Latt J. Watson M. Loken	L. Ornstein G. Valet H. Steen
June 1984–November 1985			
Officers:	President: P. Horan President-Elect: D. Arndt-Jovin	Secretary/Treasurer: S. Cram Past-President: L. Wheelless	
Councilors:	L. Dethlefsen J. Jett A. Waggoner	J. Watson M. Loken J. Visser	G. Valet H. Steen Z. Darzynkiewicz
November 1985–August 1987			
Officers:	President: D. Arndt-Jovin President-Elect: S. Cram	Secretary/Treasurer: J. Jett ^d Past-President: P. Horan	
Councilors:	I. Nishiya ^d A. Waggoner K. Muirhead	M. Loken J. Visser B. Gledhill	H. Steen Z. Darzynkiewicz M. Fox
August 1987–September 1988			
Officers:	President: S. Cram President-Elect: K. Ault	Secretary/Treasurer: J. Jett Past-President: D. Arndt-Jovin	
Councilors:	A. Waggoner K. Muirhead D. Hedley	J. Visser B. Gledhill H. Tanke	Z. Darzynkiewicz M. Fox T. Lindmo
September 1988–March 1990			
Officers:	President: K. Ault President-Elect: O.D. Laerum	Secretary/Treasurer: J. Jett Past-President: S. Cram	
Councilors:	K. Muirhead D. Hedley M. Lelande	B. Gledhill H. Tanke F. Mauro	M. Fox T. Lindmo K. Bauer
March 1990–August 1991			
Officers:	President: O.D. Laerum President-Elect: B. Gledhill	Secretary/Treasurer: J. Jett/P. Dean ^e Past-President: K. Ault	
Councilors:	D. Hedley M. Lelande H. Crissman	H. Tanke F. Mauro A. Hurley	T. Lindmo K. Bauer J. Gray
August 1991–March 1993			
Officers:	President: B. Gledhill President-Elect: Z. Darzynkiewicz	Secretary: P. Dean Treasurer: A. Landay	
Past-President: O.D. Laerum			
Councilors:	F. Mauro H. Crissman S. Papa	K. Bauer A. Hurley G. Valet	M. Lelande/P. Rabinovitch ^f J. Gray B. Ohlsson-Wilhelm

(continued)

Table 2
(Continued)

March 1993–October 1994			
Officers:	President: Z. Darzynkiewicz President-Elect: F. Mauro Past-President: B. Gledhill	Secretary: P. Dean Treasurer: A. Landay/P. Rabinovitch ^a	
Councilors:	H. Crissman S. Papa G. Salzman	A. Hurley G. Valet L. Staiano-Coico	J. Gray B. Ohlsson-Wilhelm P. Rabinovitch/M. Ormerod ^b
October 1994–April 1996			
Officers:	President: F. Mauro President-Elect: J. Gray Past-President: Z. Darzynkiewicz	Secretary: P. Dean Treasurer: L. Staiano-Coico	
Councilors:	S. Papa G. Salzman F. Lacombe	G. Valet D. Swartzendruber ^h H. Nakauchi	B. Ohlsson-Wilhelm M. Ormerod M. Pallavicini
April 1996–March 1998			
Officers:	President: J. Gray President-Elect: J. Watson Past-President: F. Mauro	Secretary: N. Carter Treasurer: L. Staiano-Coico	
Councilors:	G. Salzman F. Lacombe G. Chojnowski	D. Swartzendruber H. Nakauchi J. Jacobberger	M. Ormerod M. Pallavicini A. Orfao

^aThis table lists the period of service of all Officers and Councilors of the Society. Each term begins and ends with a congress. Three new Councilors take office at each congress. The table lists the councilors in order of election, with the newest Councilors in the bottom row.

^bP. Mullaney died while in office and his duties were assumed by L. Wheless.

^cLeft vacant in honor of Paul Mullaney who died in office in 1981.

^dS. Cram was elected President-Elect and was replaced as Secretary/Treasurer by J. Jett, who was replaced as Councilor by I. Nishiya.

^eJ. Jett resigned as Secretary/Treasurer in March, 1991 and was replaced by P. Dean.

^fM. Lelande resigned in 1992 and was replaced by P. Rabinovitch.

^gA. Landay resigned as Treasurer in July 1993 and was replaced by P. Rabinovitch. M. Ormerod was appointed to complete Rabinovitch's term as Councilor.

^hL. Staiano-Coico was elected Treasurer and D. Swartzendruber was appointed to complete her term as Councilor.

major responsibility of the President was to chair the conference, and the Council met only at the conference. Under some pressure from the membership, the Council decided that the Society should accept a broader role in regulatory affairs, certification, and education, including sponsoring of workshops, meetings, and consensus groups. However, the original version of the Constitution and Bylaws did not lend itself to the kinds of activities envisioned. In 1989, a Constitutional Revision Committee was convened to examine the Constitution and Bylaws and to recommend any changes that might be needed. At the Asheville conference in March, 1990, the Committee and Council together recommended a number of changes to the documents. These changes were discussed with Society members at the Business Meeting and then proposed to the general membership by mail. The changes were approved overwhelmingly by late Spring of 1990 and immediately became effective. The major changes included adding "International" to the name of the Society, separating the Secretary/Treasurer office into two offices and setting their period of service to three terms (staggered), requiring a mail ballot to change the Constitution and Bylaws, and the formation of four Standing Committees to assist the Officers in managing the Society.

CLINICAL CYTOMETRY

From an early workshop held in Davos, Switzerland, in 1970, at which the primary interest was in applying au-

tomated cytology methods to routine health testing, the field of analytical cytology became very technologically oriented, concentrating on the development of hardware and software suitable for application in the field. This development was driven by great strides in computer technology and electronics in general and by the emerging field of flow cytometry. As time passed and cytometry became a mature technology, most instrument development became concentrated in the commercial sector, and the major research laboratories began to switch to the development of applications for the technology. In 1976, a conscious effort was made to redirect emphasis to applications of the technology to biology and medicine and later to applications of the technology in the clinical laboratory. In 1984, two committees were formed to address different aspects of this issue: 1) An ad hoc Committee on Certification was formed to develop a list of generalized recommendations regarding certification or accreditation for flow cytometric technologists and 2) an ad hoc Committee on Clinical Procedures and Standards was formed to determine what deficiencies existed in the area of standards, quality control, etc., in clinical flow cytometry and to establish a plan for an interlaboratory comparative study at several levels. This effort eventually led to the formation in 1987 of a Committee on Clinical Standards by the National Committee on Clinical Laboratory Standards (NCCLS), initially chaired by Alan Landay, a Society member. A workshop on Quality Control in the

Table 3
Meetings in Automatic (Analytical) Cytology^a

Year	Meeting	Location	Program Chairman
1970	EFC Workshop on Automatic Cytology	Davos, Switzerland	K. Preston
1971	First Engineering Foundation Conference on Automatic Cytology	Henniker, New Hampshire	K. Preston
1972	Second Engineering Foundation Conference on Automatic Cytology	Saxtons River, Vermont	K. Preston
1973	Third Engineering Foundation Conference on Automated Cytology	Asilomar, California	M. Mendelsohn
1975	Fourth Engineering Foundation Conference on Automated Cytology	Asilomar, California	L. Wheelless
1976	Fifth Engineering Foundation Conference on Automated Cytology	Pensacola, Florida	P. Mullaney
1978	Sixth Engineering Foundation Conference on Automated Cytology	Schloss Elmau, Germany	T. Jovin
1979	Seventh EFC and SAC Conference on Automated Cytology	Asilomar, California	M. Mendelsohn
1981	Analytical Cytology VIII (SAC)	Wentworth, New Hampshire	M. Melamed
1982	Analytical Cytology and Cytometry IX and the VIth International Symposium on Flow Cytometry (SAC)	Schloss Elmau, Germany	K. Goerttler, J. Ploem, and L. Wheelless
1984	Analytical Cytology X (SAC)	Asilomar, California	L. Wheelless and B. Gledhill
1985	Analytical Cytology XI (SAC)	Hilton Head, South Carolina	P. Horan
1987	XII International Meeting of the Society for Analytical Cytology	Cambridge, England	D. Arndt-Jovin
1988	International Conference on Analytical Cytology XIII (SAC)	Breckenridge, Colorado	S. Cram
1990	International Conference on Analytical Cytology XIV (SAC)	Asheville, North Carolina	K. Ault
1991	XV Congress of the International Society for Analytical Cytology	Bergen, Norway	O.D. Laerum
1993	XVI Congress of the International Society for Analytical Cytology	Colorado Springs, Colorado	B. Gledhill
1994	XVII Congress of the International Society for Analytical Cytology	Lake Placid, New York	Z. Darzynkiewicz
1996	XVIII Congress of the International Society for Analytical Cytology	Rimini, Italy	F. Mauro

^aPrincipal meetings sponsored by the Engineering Foundation Conferences (EFC), the Society for Analytical Cytology (SAC), and the International Society for Analytical Cytology (ISAC).

Clinical Laboratory was held during the June, 1984, conference of the Society in Asilomar.

In 1993, the Council recognized the importance of clinical cytometry by forming the Clinical Cytometry Division. The initial officers and Councilors of this Division were:

President—Peter Rabinovitch

Secretary—Greg Stelzer

Treasurer—Betsy Ohlsson-Wilhelm

Board Members—Ken Bauer, Gunter Valet, Anne Hurley, Alberto Orfao DeMatos, Carleton Stewart, David Hedley, Michael Borowitz, Leon Wheelless.

The total membership of the Division passed 200 in late 1993. In late 1995, roughly one-half of Society members were working in some aspect of medical or clinical sciences.

PUBLICATIONS

At the first meeting of the Council of the Society for Analytical Cytology, held at Schloss Elmau in 1978, the issue arose of whether the Society should publish its own journal. There was no clear consensus among Council

members on what to do, and it was decided to put the issue to the membership at the Business Meeting. The members voted to continue a prior arrangement with the *Journal of Histochemistry and Cytochemistry*, which had been publishing selected papers from the Engineering Foundation conferences as special issues, until the membership had more time to review the options. A committee was formed to study the issue and to report back to the Council and the membership. This committee was chaired by B. Mayall and included M.L. Mendelsohn, M. Melamed, L.S. Cram, M.J. Fulwyler, and J.S. Ploem. Several possible publication arrangements were reviewed. After much deliberation, the committee voted to recommend that the Society publish a new journal starting in early 1980. The membership was polled on this issue in February, 1979. The members voted nearly 2 to 1 to have the Society publish its own journal. By June, 1979, Williams and Wilkins (Baltimore) was selected as the publisher of the new journal. The journal was to be named *Cytometry* and subtitled *The Journal of the Society for Analytical Cytology*. The first issue was scheduled for early 1980 and in fact was published in July of that year. For the journal

to be viable, it had to have a secure subscription base, so subscription to the journal was made mandatory for all Society members. The cost of the journal was included in Society membership dues. Brian Mayall was appointed Editor of the new journal, with an Editorial Policy Committee composed of L.S. Cram, M.J. Fulwyler, M. Melamed, M.L. Mendelsohn, and J.S. Ploem. Brian Mayall was still the editor in 1996. The initial Editorial Board of the journal was composed of 29 members of the Society representing nine countries throughout the world. The Board had its first meeting on November 26, 1979, and established the Editorial Policy and Instructions to Authors.

Williams and Wilkins terminated its agreement with the Society with the May, 1983, issue (Volume 3, No. 6). A contract was then signed with Alan R. Liss, Inc. The new publisher was very helpful in promoting the journal, and by 1984 there were 528 Society subscribers and 372 institutional subscribers. Alan R. Liss, Inc., published the journal through Volume 10, No. 6. At that time (1990), Alan R. Liss, Inc., merged with John Wiley and Sons. Since then, the Wiley-Liss, Inc., Division of John Wiley and Sons has published the journal. The journal's appearance has also changed over time. The change to Alan R. Liss, Inc., as the publisher resulted in a new cover and design for the journal. The cover changed again with the switch to the Wiley-Liss Division, and recently (January, 1994) the cover changed once again. The journal has also increased in size from the original 6 issues of 60 pages each to 12 issues of 90 pages each in 1996. In 1994, there were 1,812 member subscribers and about 800 institutional subscribers.

In recognition of the increased interest in clinical applications of analytical cytology methodology, a Clinical Sciences Section was added to the journal in 1993 (Vol. 14, No. 2) with Alan Landay as Clinical Editor. As interest in clinical cytometry grew, and with the advent of the Clinical Cytometry Society in 1992, ISAC decided to publish a new section of the journal, *Cytometry: Communications in Clinical Cytometry* (Mariano La Via and John Parker, Editors). This publication is also the official journal of the Clinical Cytometry Society. The journal started as a quarterly with 52 text pages per issue and is intended primarily to communicate information on topics of importance to those in the clinical laboratory.

To establish good communications with its members, the Society has published a newsletter from its beginning, at approximately 3-month intervals. In 1995, the newsletter was assigned its own editor and has the Membership Services Committee as its editorial board. To keep pace with the communication revolution, in 1995 the Society established a "home page" on the internet (<http://nucleus.immunol.washington.edu/ISAC.html>). In 1996, the Society will assist in the publication by Wiley-Liss of *Current Protocols in Cytometry*.

AWARDS

The first award made by the Society was to Sanford Cole. In 1970, at the age of 70, Sanford Cole, Director of Conferences of the Engineering Foundation of New York,

became interested in the possibilities of the new field of automatic cytology. He persuaded the Engineering Foundation to sponsor a workshop on the subject, the Davos workshop of 1970. The workshop generated considerable interest among the scientific community and led to the beginning of a series of conferences on what is now known as analytical cytology. As was noted above, this series of conferences led eventually to the formation of the Society. "Sandy" was a firm believer in the future of analytical cytology and in its ultimate benefit to society at large. At a general business meeting held in 1979, Sanford Cole was awarded an honorary membership in the Society, with the following statement: "His organizational skills, commitment, and support have nurtured the formation of the Society and the establishment of analytical cytology as a recognized scientific discipline."

In 1992, the Council of the Society established two awards to be made to Society members. An *Honorary Fellow of the Society* award was established to recognize significant contributions to the Society. To receive this award, which includes a lifetime membership in the Society, a candidate must have been a member for at least 10 years, must have participated actively in several International Congresses through chairing sessions and presenting papers, and must have contributed in a significant way to the field of analytical cytology. The *Honorary Fellow of the Society* award was presented to J. Sebastian (Bas) Ploem in 1993, to Klaus Goerttler and Marvin Van Dilla in 1994, and to Myron Melamed and Mortimer Mendelsohn in 1996. A *Distinguished Service Award* was established to honor those individuals who served the Society in a major role, provided major support to the Society and its members, or made a significant contribution to the success of the Society. To receive this award, a candidate must have been a member for at least 10 years. The *Distinguished Service Award* was presented to Wallace Coulter and Bernard Shoor in 1993, to Mack Fulwyler and Johannes Schumann in 1994, and to Leon L. Wheelless in 1996.

The Society established two additional awards in 1994, the *Presidential Award for Excellence* and the *Outstanding Student Award*. The Council believed that, to ensure the long-term growth and prosperity of the Society, there must be a steady infusion of new scientists into the field of analytical cytology. To provide encouragement for younger scientists to enter the field and to recognize excellence in their activities, beginning in 1994 at the Lake Placid Congress and at each successive Congress, the Society will present these awards. These are competitive awards, which include a substantial monetary prize.

The *Presidential Award for Excellence* is presented to one or more of the outstanding younger members of the Society. To be eligible for this award, a candidate must be a member of the Society out of postdoctoral training for no more than 5 years, have made presentations at national and international meetings, have published in refereed journals, and attend the Society's congress. In addition, the candidate must submit a brief paper on the subject of a poster presented at the congress. In 1994, the first of

these awards was presented to Stephen Lockett. In 1996, the award was presented to John Nolan.

The *Outstanding Student Award* recognizes continuing outstanding performance by a student with service to the field and to the Society. To be eligible for this award, a candidate must be a member of the Society, be a predoctoral student, and follow a field of study in any physical or natural science with a goal of working in analytical cytology. In addition, the candidate must submit a brief paper on the subject of a poster presented at the congress. In 1994, the first of these awards was presented to Alan Jones. In 1996, the award was presented to Cordelia Langford and Iona O'Brien.

SPECIALTY TRAINING AND EDUCATION PROGRAM

The Specialty Training and Education Program (STEP) was begun at the Colorado Springs Congress in 1993. This program endeavors to assist Society members in receiving highly specialized training in techniques that are not otherwise taught. The training provides beginners and experienced personnel with an opportunity to learn specialized skills under the direct tutelage of experts in the subject being taught in the laboratory of the instructor. The role of ISAC in this project is: 1) identifying the laboratories that are able and willing to provide outstanding training, technical advice, and expertise in particular fields of cytometry; 2) assessing the quality of training; and 3) making information about this training widely available. For the latter, the Society publishes a directory of participating laboratories.

AFFILIATES

In December, 1992, the Council established the position of Affiliate of the Society. To become an Affiliate of ISAC, an organization must have elected Officers and a Constitution and Bylaws or equivalent governing document approved by the members of the organization, maintain a membership roster, hold regular meetings, have at least one member who is also a member of ISAC, and appoint a liaison person to ISAC who shall be a member of ISAC. Applications for affiliate status shall be made to the Secretary of the Society and shall include all the materials specified above. As of January, 1996, there were three societies affiliated with ISAC: the Australasian Flow Cytometry Group, the Clinical Cytometry Society, and the Chesapeake Cytometry Consortium.

COUNCIL OF FEDERATED CYTOMETRIC SOCIETIES

The Council of Federated Cytometric Societies is an informal group of organizations that was formed at the Bergen Congress in 1991. At the second meeting of this Council, in Colorado Springs in 1993, representatives from many nations and organizations were present: Australia, France, Germany, Italy, Japan, Korea, Iberia (Spain and Portugal), United Kingdom, Russia, Hungary, the European Society of Analytical and Cellular Pathology (ES-ACP), and the Clinical Applications of Cytometry (CAC) Group. At this meeting some of the objectives of the Council were established: increasing participation of national delegations to ISAC congresses and other ISAC-

sponsored events, increasing participation of national societies in the scientific organization of ISAC congresses, establishing a worldwide network of continuing education and standards, making a common effort to support colleagues from underprivileged countries, and soliciting the help of ISAC in the organization of symposia or regional meetings by providing a forum for publicity in the ISAC newsletter or journals.

As of 1995, any organization is allowed to join the Council, regardless of its structure. At each ISAC Congress, this Council holds a meeting chaired by the ISAC President-Elect.

ASSOCIATED CONFERENCES

Associated conferences and/or satellite meetings are frequently held in conjunction with the ISAC conferences. Particularly for conferences held in Europe, these meetings have assisted many non-Europeans in attending the ISAC conferences. A brief description of these meetings is given in the Appendix.

EVENTS IN EUROPE

While the conferences on analytical cytology were being held in the United States, a parallel series of meetings on the same subject was being held in Europe. The presumed first meeting was held in Heidelberg, Germany, in 1973. In 1974, the First International Symposium on Pulse Cytophotometry (Flow Through Cytophotometry, Its Application in Cancer Research and Hematology with Special Reference to Cell Kinetics) was organized by C.A.M. Haanen, T.K.A. Eskes, H.F.P. Hillen, and J.M.C. Wessels and was held in Nijmegen, The Netherlands. This was a purely European event; only five persons from the United States were present. A series of conferences on the same subjects followed over the years until 1982, when the Society for Analytical Cytology (SAC) joined with the European group to organize the "Combined International Conference on Analytical Cytology and Cytometry IX and the 6th International Symposium on Flow Cytometry" and to hold it at Schloss Elmau in Bavaria, Germany. The European group then decided to halt the European meetings in favor of the SAC Conferences; in the future, roughly every third meeting would be held in Europe. This arrangement has continued to the present. SAC (and ISAC) conferences have been held in Europe in Schloss Elmau (Germany) in 1982, in Cambridge (England) in 1987, in Bergen (Norway) in 1991, and in Rimini (Italy) in 1996. A list of European meetings is included in the Appendix.

ACKNOWLEDGMENTS

Many people provided the author with significant support in the writing of this history. Especially notable are Brian Mayall, editor of the Society's journal since its beginning and a member of the Society's Council since its formation, and Barton Gledhill, Klaus Goertler, Ole Didrik Laerum, and Mortimer Mendelsohn, all charter members of the Society. The author is indebted to them and to all other reviewers of this paper.

APPENDIX

Meetings in Automatic (Analytical) Cytology

1970—Davos, Switzerland. The first recorded meeting on cytology automation was a workshop on "Automatic Cytology" held in Davos, Switzerland, in September, 1970. The workshop was held in conjunction with an Engineering Foundation conference on automated multiphasic health testing. The proceedings of the conference, edited by C. Berkeley of the Foundation for Medical Technology (Mount Sinai Medical Center, New York, NY), were copyrighted by the Engineering Foundation (New York, NY). The Library of Congress Catalog Number is 79-175-127. The proceedings of the workshop, edited by Drs. Preston and Rutovitz, were covered in pages 73–98 of the conference proceedings. The purpose of the workshop was to bring together some of the leading workers in automatic cytology to discuss the state of the art and the near future of three general fields, namely, automatic karyotyping, cervical smear analysis, and white blood cell differentiation. Included was a discussion of when these developments might become available for low-cost multiphasic health testing. There were representatives from Denmark, France, Germany, Italy, the United Kingdom, and the United States in attendance. The conclusion of the workshop was that, although much work had been done in automatic cytology and although some programs were coming close to the point at which they might benefit people working in automatic multiphasic health testing, there was still much work to carry out.

1971—Henniker, New Hampshire. The second meeting in the field was a full-fledged conference on automatic cytology held at New England College in Henniker, New Hampshire, July 26–30, 1971. This conference, chaired by K. Preston, Jr., was attended by about 60 individuals (11 from outside the United States) and was held under the auspices of the Engineering Foundation. The organizing committee included B. McCormick (University of Illinois), M. Mendelsohn (University of Pennsylvania), and A. Rosenfeld (University of Maryland). The intent of this conference was to bring together leading research scientists and engineers in automatic cytology to discuss recent developments in the field. At that time, automatic cytology was understood to deal with the implementation of high-speed imaging systems and image processing and analysis for use in the field of biomedical research. Among the attendees, however, were several scientists working in the relatively new field of flow cytometry, including cell sorting. This may, in fact, be the first formal conference at which this exciting new field was discussed. The conference included morning sessions on Cytochemistry in Automatic Cytology, Fluid Transport Methods, general Progress Reports, and Future Prospects and Needs in Automatic Cytology and Histology. Evening sessions were held on Picture Processing, Systems, Performance Metrics for Automation, and Specialized Techniques.

This and the following six conferences were sponsored by the Engineering Foundation and followed the format of its conferences: mornings were reserved for plenary sessions and the presentation of proffered papers, and the evenings were used for intensive workshop sessions at which small groups could interact closely in considering specific problems. Afternoons were generally unscheduled so that conferees could organize impromptu technical sessions or have some time off from the conference.

From this meeting until the formation of the Society in 1978, these conferences have been referred to as Engineering Foundation Conferences on Automated Cytology, with the Henniker conference being the first of the series.

1972—Saxtons River, Vermont. The third meeting (second Engineering Foundation Conference on Automated Cytology), also chaired by K. Preston, Jr., was held at the Vermont Academy in Saxtons River, Vermont, August 7–11, 1972. The organizing committee for this conference was the same as for the Henniker conference, with the addition of L. Ornstein. This meeting was very

similar to the Henniker meeting in that it dealt primarily with the implementation of high-speed imaging and image processing systems for use in biomedical pattern recognition; however, the audience was larger (about 120), and the time allocated for discussion of flow systems technology was increased considerably. Techniques for sample preparation, cell delivery and transport, quantitative cytochemistry, and methods of sample analysis were discussed as related to programs in genetics, hematology, and gynecology (especially in relation to cervical cancer). Morning sessions were held on Systems and Standards, Progress Reports, Image Processing and Texture Analysis, and Morphological Characterization. Evening sessions were held on Sample Preparation and DNA Measurements and Cell Quantitation. On two evenings, workshops were held on Standards, Cell Tagging, Coherent Optics and Spectral Analysis, Multicolor Analysis, Pattern Recognition, Flow Systems, and Systems for Handling Immobilized Cells. All major companies who were selling or preparing to sell automatic hematology microscopes using pattern recognition methods attended the meeting.

1973—Asilomar, California. The fourth conference (Third Engineering Foundation Conference on Automated Cytology) was chaired by M. Mendelsohn and was held at the Asilomar Conference Grounds in Pacific Grove, California, on December 2–7, 1973. On the Organizing Committee were P. Bartels, K. Castleman, M. Fulwyler, C. Herman, B. Mayall, and K. Preston, Jr. Attendance at this conference was estimated to be about 200, including many representatives from Europe. An arrangement was made with Dr. P. Anderson, Editor of the *Journal of Histochemistry and Cytochemistry* (published by Williams and Wilkins Company, Baltimore) to publish the proceedings of the conference as a single issue of the journal, Vol 22, No. 7, pp 451–765 (1974).

The publication arrangement with the *Journal of Histochemistry and Cytochemistry* was to last through the Sixth Engineering Foundation Conference on Automated Cytology held in April, 1978, at Schloss Elmau, Upper Bavaria, Germany. The strong technology orientation of these early conferences is reflected in the broad topics of the first publication (third conference), with 39 papers scattered through five subject areas: 1) Cytochemistry and Cell Preparation, 2) Chromosomal and Cellular Image Analysis, 3) Flow Analyzers and Cell Sorters, 4) Standards and Statistics, and 5) Integrated Systems.

1975—Asilomar, California. The Fourth Engineering Foundation Conference on Automated Cytology was also held at the Asilomar Conference Grounds, on June 8–13, 1975. With the addition of a section on Flow System and Sorter Applications, applications of automated cytology began receiving more attention in the proceedings of this conference. There was also a workshop on clinical cytology that served to introduce the physicists, biologists, and engineers to the practical problems experienced by cytopathologists. The Organizing Committee of this conference was chaired by L. Wheelless and included J. Bacus, M. Fulwyler, C. Herman, M. Melamed, and M. Mendelsohn. There were about 200 participants from 20 countries and over 90 presentations. Although imaging systems continued to play a major role in the conference, the impact of flow cytometry on the field of automated cytology was illustrated by the large number of papers presented on the subject. The importance of cytochemistry in the development of probes to be used in both image and flow cytometry was clear from the increased attention the field received at the conference. Forty-six papers were published in the *Journal of Histochemistry and Cytochemistry*, Vol 24, No. 1, pp 1–414 (1976), and make up the formal record of this conference.

1976—Pensacola, Florida. The Fifth Engineering Foundation Conference on Automated Cytology was held in Pensacola, Florida, on December 12–17, 1976. The meeting was chaired by P. Mulaney. The organizing committee included J. Bacus, M. Fulwyler, L. Hertzberg, T. Jovin, B. Mayall, M. Melamed, and L. Wheelless. The theme of this conference was "Where are we going?" The technol-

ogy was well advanced by this time, and, although some new developments would be announced, the focus of the conference was on evaluation of progress to date in terms of the original cytological questions that gave rise to current technology and consideration of the broader questions in biology and medicine to which these skills could be brought to bear. For this conference, workshops and the new "art form" of posters were used. They replaced the familiar formal platform paper presentations; it was hoped that the new forum would provide greater opportunity to review new material. The sessions would allow both spectators and authors a greater opportunity for exposure to all presentations and the opportunity to discuss related items with the authors on an informal basis. As before, many of the papers presented at the conference were published in a special edition of the *Journal of Histochemistry and Cytochemistry*, Vol 25, No. 7, pp 479–952 (1977). At this conference, discussions were begun on the possibility of forming a new society to ensure continuity of the conferences and to provide a focus for the field.

1978—Schloss Elmau, Germany. The Sixth Engineering Foundation Conference on Automated Cytology was held at Schloss Elmau in Bavaria, Germany, on April 23–29, 1978. The meeting was chaired by T. Jovin. Because this was the first in this series of conferences to be held outside the United States, an unusually large organizing committee was formed to coordinate activities on both sides of the Atlantic. The organizing committee included H. Aus, S. Cram, M. Van Dilla, M. Fulwyler, W. Göhde, K. Goerttler, M. Greaves, T. Jovin, V. Kachel, B. Mayall, M. Melamed, M. Mendelsohn, P. Mullaney, J. Ploem, R. Rigler, D. Rutovitz, J. Tucker, L. Wheelless, W. Winkler, and I. Young. To help provide funds for non-Europeans to attend the Schloss Elmau conference, four satellite meetings were organized: preconference 1) Symposium on Cell Sorting and Recognition (Leiden, The Netherlands), 2) Practical Workshop on Cell Sizing (Martinsried-München, West Germany), 3) Workshop on Automated Gynaecologic Cytology Systems (Edinburgh, Scotland); and postconference 4) EMBO Course on Cell Separation (Goettingen, West Germany). Additional funds were obtained from U.S. and West German governments and industries.

This conference continued the use of posters (two formal sessions), and this time authors were required to attend their posters for 2 hours during one of the sessions. Workshops were also heavily used, with two sessions and 20 subjects. To accommodate everything that the organizers wanted to cover, the conference was extended one half-day.

The first public meeting on forming a new society was held at this conference. The attendees voted to form the Society. The Organizing Committee of the VIth Engineering Foundation Conference was empowered to create the Society, and it in turn appointed a Founding Executive Committee to focus the effort. As before, many of the papers presented at the conference were published in a special edition of the *Journal of Histochemistry and Cytochemistry*, Vol 27, No. 1, pp 1–641 (1979).

1979—Asilomar, California. The Seventh Engineering Foundation Conference on Automated Cytology was held in Asilomar, California, on November 25–30, 1979, with approximately 275 attendees. This conference was cosponsored by the new Society for Analytical Cytology. It was chaired by the President of the new society, M. Mendelsohn, setting a precedent that has been followed to the present day. This conference was devoted to overviews and new developments in automated cytology, including concepts, instrumentation, probes, and applications to biological and clinical problems. The style and format were the same as for the previous Engineering Foundation conferences. Mornings were devoted to formal plenary presentations, one per day, with the following topics: Flow Cytometry and Sorting, Scanning Cytometry, Cytometry Probes, Biological Applications, and Clinical Applications. Afternoons were unscheduled. Poster sessions and workshops were sched-

uled for the evening. The first Business Meeting of the Society for Analytical Cytology was held during this conference. It was announced at this time that the next conference would be called Automated Cytology VIII and would be sponsored by the Society for Analytical Cytology; the Engineering Foundation would no longer be a part of the conference series. Papers from this and all succeeding conferences were published in the Society's new journal, *Cytometry*.

1981—Wentworth, New Hampshire. Analytical Cytology VIII was held in Wentworth, New Hampshire, on May 19–25, 1981. The conference was chaired by M. Melamed, President of the Society for Analytical Cytology, and had about 250 attendees, 120 of whom were Society members. This ratio has been about the same since that time. The philosophy of this meeting emphasized concise reviews in the plenary sessions, short talks for presentation of up-to-date research results, poster sessions for those wishing to present detailed points, and less formal workshops. Abstracts were assigned to either oral or poster presentations based on content and the preference of the author. The conference was somewhat unusual in that it started with a plenary session on Tuesday afternoon and ended on Monday at noon. Topics were: Cancer Detection and Diagnosis, Immunology and Hematology, Chromatin and Chromosomes, Cell Growth and Differentiation, Technology of Analytical Cytology, and The Coming Decade: New Applications of Analytical Cytology. Following the practice established in Asilomar, afternoons were generally free, and posters and workshops were scheduled for the evenings.

1982—Schloss Elmau, Germany. The next conference was held on October 18–23, 1982, in Schloss Elmau, West Germany. It was a combined international conference and was entitled Analytical Cytology and Cytometry IX and the VIth International Symposium on Flow Cytometry. In parallel with the conferences that were being sponsored by the Engineering Foundation and then the Society for Analytical Cytology, a series of conferences was being held in Europe on basically the same topic. A list and brief descriptions of these conferences can be found elsewhere in this Appendix. The two organizing committees agreed to hold a joint conference in 1982, after which the European series was halted with the understanding that the SAC conference would be held in Europe about every third time. The 1982 conference was the first SAC conference to be held in Europe. The organizing committee consisted of K. Goerttler, J. Ploem, and L. Wheelless; an additional 26 persons formed the scientific program committee. The conference contained four plenary sessions with 40 speakers, 14 workshops, and 214 of the increasingly popular posters. Major topics covered at this conference were Biological Challenges, Quantitative Cytometry in Modern Biology, Techniques in Cytometry, and Analytical Cytology in Disease Detection and Management. A satellite conference with 75 attendees was held in Munich before the Schloss Elmau Conference. The symposium focused on cytometric approaches to biological dosimetry and resulted in a book on the subject containing 30 of the 36 presentations.

1984—Asilomar, California. Analytical Cytology X was held on June 3–8, 1984, at the Asilomar Conference Grounds in Pacific Grove, California. The conference was cochaired by L. Wheelless and B. Gledhill and attracted well over 400 attendees, more than double the number who were at Schloss Elmau. The program included five plenary sessions, four poster sessions, and three workshops. This conference was the first of the series to include tutorial sessions (five of them), which were intended to provide an opportunity for new workers in the field of analytical cytology to gain an introduction to different aspects of the field. These sessions were the first to be presented each day. Another new topic that was added for this conference was formal presentations by the industrial exhibitors.

1985—Hilton Head, South Carolina. Analytical Cytology XI was held on November 17–22, 1985, in Hilton Head, South Carolina. The Conference Chairman was P. Horan, and the Scientific Program

Chairman was A. Waggoner. Approximately 480 people attended this conference. Following the pattern established at the earlier conferences, each day was begun with a plenary session. At this conference, workshops and industrial sessions were held in the afternoon and poster sessions in the evening.

1987—Cambridge, England. The XII International Meeting of the Society for Analytical Cytology was held in Cambridge, England, on August 9–15, 1987. The meeting was chaired by D. Arndt-Jovin, President of the Society, and had about 670 participants, 300 of them SAC members. This conference tried a new meeting format. The first two half-days were devoted to parallel symposia with 50–100 participants each. They were modeled on the EMBO workshops and Gordon conferences. This provided an opportunity for a small number of people with a common vocabulary to present unpublished results and to discuss experimental details within a narrow interest area. Each attendee of the conference was asked to sign up for only one symposium; some joint sessions were held. Posters were thematically grouped and were on display for the entire conference. In keeping with tradition, the afternoons were left free to encourage more personal and informal interactions and exchange of information.

1988—Breckenridge, Colorado. The International Conference on Analytical Cytology XIII was held on September 4–9, 1988, in Breckenridge, Colorado. The conference was chaired by S. Cram, President of the Society, and had about 800 participants, 600 from the United States and the remainder mostly from Europe. This conference introduced a new format. Each day started with a plenary session of 1 hour 20 minutes. The plenary session was followed by several parallel sessions covering distinctly different subjects, e.g., clinical applications in cancer, cytogenetics, and immunology. Parallel sessions were also held in the evenings. Poster sessions were held in the afternoons. Another innovation was the tutorial session on Sunday. Four scientific and two commercial tutorials were offered to conference attendees. These sessions were designed to provide attendees with either an introduction to, or detailed training in, specific subjects.

1990—Asheville, North Carolina. The International Conference on Analytical Cytology XIV was held on March 18–23, 1990, in Asheville, North Carolina. The conference was chaired by K. Ault, President of the Society, and had 911 registered participants from 25 countries. This is the current (as of 1995) record for number of attendees. The format of the conference was essentially the same as for the Breckenridge conference and included 213 speakers and more than 350 posters. A major event at this conference was the discussions leading to revision of the Society's Constitution and By-laws and changing the name of the Society to The International Society for Analytical Cytology.

1991—Bergen, Norway. The XV Congress of the International Society for Analytical Cytology was held on August 25–30, 1991, in Bergen, Norway. The Congress was chaired by O.D. Laerum, President of the Society, and had about 750 participants from 26 countries. The conference started with 2 days of tutorials: commercial tutorials on Saturday and scientific tutorials on Sunday. The main conference was held in the Grieg Hall, with some parallel sessions held in nearby hotels. Monday through Friday were started with "Eye-Opener Sessions," which were intended to be introductory or refresher lectures. They were followed by plenary sessions in the mornings and parallel sessions in the afternoon; evenings were unscheduled.

1993—Colorado Springs, Colorado. The XVI International Congress of the International Society for Analytical Cytology was held on March 21–26, 1993, in Colorado Springs, Colorado. The Congress was chaired by B. Gledhill, President of the Society, and had about 900 participants from 32 countries. On Sunday afternoon, this conference introduced a special program of lectures directed to those individuals wishing a concise introduction to the field. The

topics were Flow Cytometry, Image Cytometry, In Situ Hybridization, and Clinical Cytometry. The lectures proved to be very popular, especially among the Society's newer members. Commercial and scientific tutorials were held on Saturday and Sunday, as before. Each day began with an eye-opener lecture on new technologies in cytometry (e.g., virtual reality, nanotechnology, and biotechnology), followed by a plenary session. Late mornings were filled with either poster or workshop sessions, which continued into the afternoon. Evenings were reserved for more plenary sessions or workshops. At this Congress, workshops, 32 of them, were returned to the format in an effort to provide more time for attendees to focus on up-to-the-minute issues, interests, and problems. This congress was also the forum for discussions by members of the Society interested in clinical applications of cytometry, which ultimately led to the formation of the Clinical Cytometry Division of the Society. Another innovation at this Congress was the announcement of three new Society awards. The *Honorary Fellow of the Society Award* was presented to J.S. Ploem and *Distinguished Service Awards* were presented to W. Coulter and B. Shoor. Also, *Outstanding Posters Presented by a Student Awards* were made to L. Kelley, J. Mullikin, and B. Dien.

1994—Lake Placid, New York. The XVII International Congress on Analytical Cytology was held on October 16–21, 1994, in Lake Placid, New York. The Congress was chaired by Z. Darzynkiewicz, President of the Society, and had 860 registered participants from 32 countries. This Congress used basically the same format as the Colorado Springs Congress. Major events during the Congress were a symposium on heterogeneity of tumor cell populations and a plenary session on apoptosis, both very active fields of research. For the first time, abstracts could be submitted electronically through a server at the Los Alamos National Laboratory. Following recent developments in the Society, clinical topics were very prominent. The Clinical Cytometry Division played an active role in the organization of the clinical segments of the Congress. *Honorary Fellow of the Society Awards* were presented to K. Goerttler and to M. Van Dilla. *Distinguished Service Awards* were presented to M. Fulwyler and J. Schumann. A new award, the *Presidential Award for Excellence*, was presented to S. Lockett. Another new award, the *Outstanding Student Award*, was presented to A. Jones.

1996—Rimini, Italy. Congress XVIII of the International Society for Analytical Cytology was held on April 13–18, 1996 in Rimini, Italy. The meeting was chaired by Francesco Mauro, President of the Society, and, in a departure from the past, the scientific program was organized by Joe Gray and Maria Pallavicini. At this Congress the Council decided the President-Elect will be responsible for the scientific program of all future congresses. The meeting featured plenary lectures on analytical cytology technology, frontiers lectures featuring novel technologies or biological applications, parallel symposia, and scientific and commercial tutorials. In addition, in another departure from the past the program included five parallel biological themes: Biological Dosimetry, Analytical Cytology Technology, Cell Cycle, Tumor Heterogeneity, and Immunology/Hematopoiesis/AIDS. The meeting was also unusual in that the entire congress was sited in one building, the Palacongressi; this had not been achieved for many years. *Honorary Fellow of the Society Awards* were presented to Mortimer L. Mendelsohn and to Myron R. Melamed, the *Presidential Award for Excellence* was awarded to John P. Nolan, and *Outstanding Student Awards* were presented to Cordelia Langford and Iona E. W. O'Brien.

Future ISAC Conferences

The active growth of the Society has required the use of ever larger facilities for its congresses. This requires holding the meetings in places that can accommodate the large number of attendees, close to 1,000 in 1993. This has also required scheduling the location of the meetings far in advance. The next two congresses are

scheduled as follows: Colorado Springs, Colorado, in 1998, and Montpellier, France, in 2000. The Society has a Site Selection Committee charged with the responsibility for making sure that proposed locations fulfill the requirements of the congress.

European Meetings

1973—Heidelberg, Germany. A Symposium on Impulsocytophotometric was held on May 11 and 12, 1973, in Heidelberg, Germany. This is acknowledged as the first European symposium in this new field. The symposium was organized by K. Goerttler and was attended by 43 scientists from seven countries: Austria, the Federal Republic of Germany, The Netherlands, Norway, Spain, Sweden, and Switzerland.

1974—Nijmegen, The Netherlands. The First International Symposium on Pulse Cytophotometry was organized by the Department of Hematology and Gynecology, University Hospital, St. Radboud. The Organizing Committee was C. Haanen, T. Eskes, H. Hillen, and J. Wessels.

1975—Munster, Germany. The 2nd International Symposium On Pulse Cytophotometry (Flow Through Cytophotometry, Its Application in Cancer Research and Hematology With Special Reference to Cell Kinetics) was organized by the Medizinische Klinik und Poliklinik and Fachklinik Hornheide. The Organizing Committee was T. Buchner, W. Göhde, and J. Schumann.

1976—Heidelberg, Germany. A workshop on Technologies for Automation in Cervical Cancer Screening was held in Heidelberg, Germany, on June 13–19, 1976. The workshop was organized by K. Goerttler and C. Herman and was jointly sponsored by the Federal Republic of Germany and the U.S. National Institutes of Health. At this workshop, preliminary plans were made to hold an Engineering Foundation Conference in Germany, which eventually resulted in the Elmau conference of 1978.

1976—Vienna, Austria. The 3rd International Symposium on Pulse Cytophotometry was organized by Ludwig Boltzmann Institute for Leukemia Research and Hematology. The Program Committee was S. Barranco, H. Crissman, M. Van Dilla, P. van Duijn, W. Göhde, C. Haanen, O.D. Laerum, D. Lutz, G. Prenna, J. Schumann, A. Stacher, and M. Stöhr. The Organizing Committee was H. Desser, D. Lutz, H. Nowotny, W. Paukovits, and A. Stacher.

1978—Schloss Elmau, Germany. The (6th) Engineering Foundation Conference on Automated Cytology was held for the first time in Europe, in Schloss Elmau, Germany. The Chairman was T. Jovin. A description of this conference is given elsewhere in this Appendix.

1979—Voss, Norway. The 4th International Symposium on Flow Cytometry (Pulse Cytophotometry) was organized by the University of Bergen. The Organizing Committee was O.D. Laerum, T. Lindmo, and E. Thorud.

1980—Rome-Bracciano, Italy. The 5th International Symposium on Flow Cytometry was organized by CNEN (now ENEA) and Istituto Medico e di Ricerca Scientifica. The Program Committee was F. Mauro, O.D. Laerum, C. Nervi, J. Schumann, and M. Van Dilla. The Organizing Committee was A. Chiabrera, G. Brambilla, G. Briganti, G. Mazzini, S. Parodi, and G. Starace.

1982—Schloss Elmau, Germany. At the next symposium (the first under the sponsorship of the then Society for Analytical Cytology), the decision was made to merge the Europe-based symposium series with the conferences initially sponsored by the Engineering Foundation. In fact, the next event was officially named (as reported in the original program) as follows: Combined International Con-

ference on Analytical Cytology and Cytometry IX and the 6th International Symposium on Flow Cytometry. The Organizing Committee was K. Goerttler, J. Ploem, and L. Wheelless.

1986—Schloss Elmau, Germany. A third Schloss Elmau conference was held on April 20–26, 1986. This conference, entitled Clinical Cytometry and Histometry, was organized by G. Burger, K. Goerttler, J. Ploem, and L. Wheelless and was sponsored by the Society for Analytical Cytology; the Gesellschaft für Strahlen- und Umweltforschung mbH, München; and the Concerted Action on Automated and Analytical Cytology of the European Communities.

Associated Meetings

A series of International Conferences on Image Analysis and Pre-screening Automation was begun in 1975 with a conference on The Automation of Uterine Cancer Cytology, Tutorials of Cytology, in Chicago, Illinois. This series of conferences has been limited to the application of image processing and analysis in analytical cytology and has always had a strong clinical orientation. Nevertheless, the activities of the group sponsoring these conferences had a strong effect on the founding and organization of the Society.

1982—Neuherberg, Germany. An International Symposium on Biological Dosimetry: Cytometric Approaches to Mammalian Systems was held on October 14–16, 1982, at the GSF Research Center in Neuherberg, West Germany. The Symposium was organized by W. Eisert and M. Mendelsohn and was cosponsored by the Society. This symposium, the first of its kind, summarized the state of the art of quantitative cytometry in biological dosimetry. Biological dosimetry relies on selective, quantitative biological responses to external stimuli. The major type of responses discussed at the symposium were cytogenetic, mutational, reproductive, hematologic, immunologic, kinetic, and metabolic.

Clinical Meetings

1982—Santa Barbara, California. On April 25–30, 1982, the Society cosponsored the first conference on Cytometry in the Clinical Laboratory. Other sponsors were the Engineering Foundation, the University of California at San Francisco, and the Lawrence Livermore National Laboratory. The conference included plenary sessions, posters, demonstrations, workshops, panels, and time for informal discussions.

1983—Sea Island, Georgia. The second conference dealing specifically with clinical cytometry was held on December 7–12, 1983. The conference was cosponsored by the Society and the Engineering Foundation and was chaired by M. Andreeff. There were 87 registered participants.

Clinical Applications of Cytometry (CAC) Meetings

Charleston, South Carolina. Following the 1983 meeting sponsored by the Engineering Foundation, a series of meetings ensued that emphasized the subject of clinical cytometry. A Steering Committee of Clinical Applications of Cytometry (CAC) was formed in 1984 to manage these meetings, which began in 1986 and have been held annually since then. These meetings are directed to an audience representing all levels of expertise in clinical cytometry. The meetings include discussions of well-established applications as well as presentations on new technologies ready for clinical application. A determined effort has been made to minimize any overlap between these meetings and those of ISAC. This series of meetings led eventually to the formation of the Clinical Cytometry Society in 1993 and to the joint publication, with ISAC, of *Cytometry: Communications in Clinical Cytometry*.