

Women in ASPET: A Centennial Perspective

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Introduction

As the centennial approaches, the Women's Committee of ASPET was inspired to document, recognize and commemorate the contributions of women to the Society. This retrospective analysis provides a review of the role women played in the leadership, growth and accomplishments of ASPET since its formation in 1908. The information gathered was highly dependent on records from ASPET as documented in editions of *The Pharmacologist*, a documentary of the first 60 years of ASPET (Chen, 1969), the assistance of the ASPET Executive Office, information readily available on the internet, and our collective recollection of events and situations. We hope that this information is both informative and useful as we move into ASPET's next century.

The First 60 Years

ASPET was founded in 1908 by 18 male pharmacologists, including John Jacob Abel, often considered the "Father of Pharmacology." Women did not have a major role in ASPET in the early years, likely more a reflection of the times and the role of women in science than of any conscious decision or philosophy of exclusion by the Society. The growth of the involvement of women in ASPET seems to have paralleled the growth of women in other societies (Lees, 2002) and women in science and medicine in general (Jagsi et al., 2006). Men were clearly more entrenched in ASPET in the early 1900s, consistent with societal gender roles. It was not until the late 1970s that the number of women admitted to ASPET reached a level high enough to exert a significant influence on Society thoughts and activities.

The women elected to ASPET during the first 30 years are listed in Table 1. For those women whose photographs were available, they are shown in Figure 1. To the best of our knowledge, Louise Pearce was the first woman elected to the Society, and from 1915 to 1929, was the only female member of ASPET (Chen, 1969). Louise was not a 'card-carrying' pharmacologist, but rather a physician pathologist who graduated from Stanford University with a bachelor's degree in physiology and from The Johns Hopkins University School of Medicine with an M.D.. She spent most of her career at the Rockefeller Institute for Medical Research in New York and was the first woman to work with its director, Simon Flexner, although she was never granted 'full' membership at that institution. Her involvement with pharmacology resulted from her breakthrough studies with Flexner leading to the development of tryparsamide, an effective therapy for African sleeping sickness. She pursued therapeutic studies with this drug when an outbreak occurred in the Belgian Congo, for which she received the King Leopold II prize along with a check for ten thousand dollars from the Belgian government. Louise also served as part-time president of the Woman's Medical College of Pennsylvania from 1946 to 1951. Louise died in 1959 after a short illness. Additional information may be found at:

http://www.nlm.nih.gov/changingthefaceofmedicine/physicians/biography_248.html.

Table 1. Women members of ASPET prior to 1940

| Year | Name |
|------|-------------------|
| 1915 | Louise Pearce |
| 1929 | Helen Bourquin |
| 1931 | Helen Graham |
| 1933 | Janet Travell |
| 1934 | Gerty Cori |
| 1937 | Phoebe Crittenden |
| 1939 | Helen Coombs |

¹The information contained in this Table was taken from Chen (1969) based on the assumption that newly elected female members of ASPET have been listed using first names while male members have been listed predominantly by first initials only.

Helen Bourquin, the second female member of ASPET, graduated from Colorado College, and received an M.A. and Ph.D. from the University of Chicago. Although it has been somewhat difficult to trace Helen's career path, she was a member of the Department of Physiology at The University of South Dakota at about the time she was elected to membership in ASPET, and she relocated to the Department of Materia Medica and Therapeutics at the University of Michigan Medical School shortly thereafter. Helen's research focused primarily on diabetes.

Helen Graham, the third woman elected to ASPET membership, received her bachelor's and master's degrees from Bryn Mawr College, and her Ph.D. in chemistry from the University of Chicago. Helen worked in the laboratory of John Jacob Abel at the Johns Hopkins University Medical School while her surgeon husband, Evarts A. Graham, was in the military. When her husband accepted the Chair of the Department of Surgery at the Washington University School of Medicine, Helen joined the faculty as a research assistant in pharmacology. She was elected to ASPET membership the same year she was promoted to assistant professor. Helen gradually rose through the faculty ranks, and almost 30 years later, was promoted to professor in the Department of Pharmacology. Helen's research focused on the physiology and pharmacology of peripheral nerves, as well as histamine. She discovered that mast cells and basophils stored histamine, and she developed methods for measuring histamine in body fluids. Helen was a unique woman who balanced numerous roles and was an inspiration to all who knew her. Helen died in 1971 at the age of 81 on the way to her office. For more information on this truly inspiring individual, please see:

<http://beckerexhibits.wustl.edu/women/graham.htm>

Janet Travell, the fourth woman in ASPET, graduated Phi Beta Kappa from Wellesley College and received her M.D. in 1926 from Cornell University Medical College where she spent her career. Janet's life was filled with firsts: she was first in her graduating class at Cornell; she was the only female intern on the staff at New York Hospital; and she was the first woman to hold the position of White House physician. Janet achieved the rank of associate professor of pharmacology at Cornell in 1952, and she was a pioneer in elucidating the contribution of muscle trigger points to acute and chronic pain syndromes. She co-authored the textbook "Myofascial Pain and Dysfunction: the Trigger Point Manual" with David Simons. She also wrote her autobiography, published in 1968. Janet succumbed to heart failure at home in 1997. For more information on this outstanding woman, the reader is referred to:

<http://www.gwu.edu/gelman/archives/exhibits/travell/>

<http://www.pain-education.com/100143.php>

<http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=152828>

Gerty Cori, the first American woman to receive the Nobel Prize in Physiology or Medicine, was born and studied in Prague and received her medical degree from the Medical School of the German University of Prague in 1920. During that same year, she married Carl Cori and published her first paper with her husband. The Coris immigrated to the U.S. in 1922 to pursue their research at the New York State Institute for the Study of Malignant Diseases in Buffalo. After they became naturalized citizens in 1931, Carl accepted the position of professor and Chair of the Department of Pharmacology at the Washington University School of Medicine. Because two members of the same family could not simultaneously hold faculty appointments, Gerty became a research fellow in the Department where she spent the next 16 years as a research associate. In 1946, when Carl became Chair of the new Department of Biochemistry, Gerty was finally promoted to professor of pharmacology. The Coris received the Nobel Prize in 1947 for their studies on carbohydrate metabolism and the enzymes that interconvert glycogen to glucose. Gerty suffered from myelofibrosis for nearly 10 years and died in 1957. More information on this outstanding woman is located at:

http://nobelprize.org/nobel_prizes/medicine/laureates/1947/cori-gt-bio.html

http://www.nlm.nih.gov/changingthefaceofmedicine/physicians/biography_69.html

<http://beckerexhibits.wustl.edu/mowihsp/bios/cori.htm>

The last two women to be elected into ASPET prior to 1940 are Phoebe Crittenden and Helen Coombs. Unfortunately, we could not find out as much about these women as the other five. From her publications, Phoebe Crittenden, who published as P. Jeanette Crittenden, P.J. Crittenden and Phoebe J. Crittenden, was on the faculty of the Department of Physiology and Pharmacology at Northwestern University Medical School in the mid-late 1930s, and at the Merck Institute for Therapeutic Research in New Jersey in the mid-late 1940s. Her research focused on pancreatic secretions, renal excretions, and amino acids. She appears to have accepted a faculty position at Goucher College in the late 1940s or early 1950s, and either discontinued her research or her publishing, as was common in those years for female scientists on the faculty at women's colleges (Appel, 1994). Helen Coombs was a faculty member in the Department of Physiology at New York University and Bellevue Medical College and New York Homeopathic Medical College, which later became

New York Medical College. Helen published many articles on cortical stimulation, seizures and neuronal control of the cardiovascular and respiratory systems.



Louise Pearce
(1915)



Helen Bourquin
(1929)



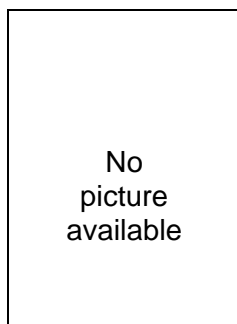
Helen Graham
(1939)



Janet Travell
(1933)



Gerty Cori
(1934)



No picture available
Phoebe Crittenden
(1937)



Helen Coombs
(1939)

Fig. 1. Women members of ASPET from the inception of the Society until 1940. The number in parentheses is the year the individual was elected to ASPET

Based on the data presented by Chen (1969) and the assumption noted in Table 1, by the end of 1939, of the 265 members of ASPET, women represented 2.6% of the total, and in the 30-year span from 1939 until 1969, the number of female members of ASPET (Table 2) remained fairly constant, representing less than 5% of the total membership.

Table 2. Number of Female members of ASPET from 1908 until 1970

| Year | Cumulative Number of ASPET Members ² | Cumulative Number of Female Members ¹ | Female members as a Percent Total |
|------|---|--|-----------------------------------|
| 1939 | 265 | 7 | 2.6 |
| 1949 | 512 | 12 | 2.3 |
| 1959 | 1014 | 29 | 2.9 |
| 1969 | 1804 | 69 | 3.8 |

¹ As in Table 1

² Estimated from data in Chen (1969).

The 1970s: An Informal Role for Women in ASPET

ASPET was a highly prominent and desirable society for membership among both male and female pharmacologists, an image that was retained in part through the extensive nomination process and necessary membership voting required before admission to the Society. Membership signified a “coming of age” acceptance into a prestigious group of scientists

recognized for their creativity, innovative research and documented independence. We would imagine that women struggled to achieve recognition for independent research careers during this period.

To ascertain the growth in the number of female members of ASPET from 1970 to the present, we reviewed the new member lists provided by ASPET for 1970, 1980, 1990 and 2000, and with an imperfect assessment of the gender determined by first names, we estimated the number of women in ASPET at the beginning of each decade (Figure 2). Although this estimate has several limitations, including the difficulty of assigning gender to names of foreign scientists as ASPET increased its diversity through the years, data indicate that since 1970, female membership in ASPET increased substantially with a fairly linear trend.

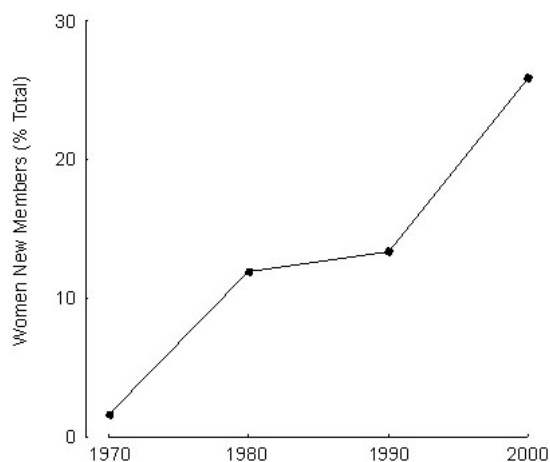


Fig. 2. Growth in the Number of Women in ASPET since 1970

As the number of women in ASPET grew, so did the role of women in influence and leadership of the Society. During the 1970s, women were often influential in rather informal ways, particularly at the fall ASPET meetings, which were attended by both scientists and their families. These meetings provided ample opportunity for women to serve as role models for students and younger female pharmacologists. At breakfast in the hotel, one might find Eva Killam along with one or more of their children, or Elaine Sanders-Bush and her daughter. The informality was particularly useful to young women, as it provided opportunities to mingle, interact and observe the juggling of roles between parenthood and professional life. This type of mentoring opportunity was lost when ASPET eventually moved to only one annual meeting in the spring. To a large extent, these informal interactions and observations shaped collective views of juggling work life issues, in marked contrast to the current need for institutionalized symposia, workshops, corporate divisions and academic departments focused on the topic of mentoring.

The 1980s and Beyond: Women in ASPET Leadership

The ASPET Executive Office

ASPET has had only four Executive Officers in its 100-year history, viz., Ellsworth Cook and Houston Baker followed by two women, Kay Croker and Christine Carrico (Figure 3). Thus, early memories of women in leadership roles in ASPET (other than as wives of prominent men) began with the promotion of Kay Croker from an administrative support role to that of the first female Executive Officer of the Society, a position she held from 1977-1997. This represented an historical move for ASPET, as Kay had served as the administrative assistant to Houston Baker, the previous Executive Officer of the Society.

Although Kay was familiar with society affairs, she recalled the difficulty ASPET had with the decision to promote a woman to this major position in the historically male society. For 20 years until her retirement, Kay served ASPET as it grew in membership and financial independence, and she was instrumental in encouraging the formation of a Women's Subcommittee of ASPET in 1980.



Kay Croker
(1981-1997)



Christine Carrico
(1998 – present)

Fig. 3. Women Executive Officers of ASPET. The numbers in parentheses are the years the individuals serve(d).

Following Kay's retirement in 1997, ASPET was extremely fortunate to recruit Christie as its Executive Officer. Christie was a 'card-carrying' pharmacologist and member of ASPET who served previously as the Executive Director of the Biophysical Society and had considerable experience in management and governmental affairs, and the needs of biomedical scientists. As a consequence, Christie has played a pivotal role in reorganizing the ASPET office, initiating new safeguards and controls, and encouraging leadership to implement new programs and initiatives. Christie helped transition the office to new facilities, supported the formation of a new ASPET journal, consolidated the office staff, and stabilized the financial situation of ASPET during the investment downturn from 2001 to 2004. Christie's strong managerial skills continue to serve ASPET well.

ASPET Officers

Although female membership in the Society increased steadily from 1970, ASPET, like many other scientific societies, was enriched and entrenched with many male colleagues of prominence and stature. Unfortunately, women were not recognized similarly. In spite of the rise in the number of female members of ASPET from 1970 to the present, the first female Councilor, Eva King Killam, was not elected to serve until 1973; the first female Secretary/Treasurer, Ruth Levine, was not elected until 1975, and it was not until 1984 that ASPET elected its first female president, Marjorie Horning. As a matter of note, ASPET has had only five female presidents in its 100-year history (Table 3, Figure 4).

It is interesting that the first two female presidents of ASPET were each married to prominent scientists with whom they worked and collaborated closely. Marjorie Horning obtained a position at the NIH in 1951, where her husband, Evan Horning, had been appointed Chief of the Laboratory of the Chemistry of Natural Products. Marjorie was a prominent biochemist, a recipient of the Garvan Award of the American Chemical Society in 1977, and became a National Honorary Member of Iota Sigma Pi (National Honor Society for Women in Chemistry) in 1985, one of the highest honors bestowed on female chemists.

Similarly, Eva King Killam, ASPET's second female president, was a life-long co-investigator with her husband Keith Killam. In 1953, Eva King moved to the UCLA Medical School, and in 1954, she received the John J. Abel Award for outstanding research in neuropsychopharmacology, the first woman to receive this prestigious ASPET award. After marrying Keith Killam, the couple moved to Stanford University in 1959 where Eva worked as a research associate while Keith joined the faculty of the School of Medicine as an associate professor of pharmacology. The Killams moved to the University of California at Davis in 1968 where Keith founded the Department of Pharmacology, and Eva joined the faculty first as a professor of physiology, and in 1972, as a professor in the Department of Pharmacology. Eva not only served as ASPET President, but was also President of the Western Pharmacology Society and President of the American College of Neuropsychopharmacology. She was well known to all pharmacologists as she served as the editor-in-chief for the *Journal of Pharmacology and Experimental Therapeutics* from 1978-1991.

Sue Duckles was the third female president of ASPET. Sue received a B.A. in Philosophy from the University of California at Berkeley and a Ph.D. in Pharmacology from the University of California at San Francisco. She pursued postdoctoral studies and was an assistant professor at the University of California at Los Angeles before relocating to the Department of Pharmacology at the University of Arizona. In 1985 she moved to the University of California at Irvine where she currently serves as Professor and Vice-Chair of the Department of Pharmacology and Associate Dean. Sue is a cardiovascular pharmacologist and neuroscientist studying the influence of gender and sex steroid hormones on vascular reactivity and mitochondrial function. Sue served as President of the Western Pharmacology Society and as a member of the Board of Directors and Vice President for Science Policy for the Federation of American Societies for Experimental Biology. In 2000 she became founding Chair of the Editorial Board for a new ASPET publication, *Molecular Interventions*. Sue has the distinct honor of serving the international pharmacology community, first as the first female Secretary General for a four-year term, and currently as President of the International Union of Pharmacology (IUPHAR). Sue was the first female recipient of the ASPET Torald Sollman Award in 2007.

Marlene Cohen, elected ASPET President in 2001, received her undergraduate degree in pharmacy from the University of Connecticut and her Ph.D. from the Department of Pharmacology at the University of California San Francisco Medical Center. She completed a postdoctoral fellowship at the Roche Institute of Molecular Biology and joined Eli Lilly and Company Research Laboratories in 1975, from where she retired in 2002. She also served as adjunct Professor of Pharmacology and Toxicology at Indiana University School of Medicine. During her tenure with Eli Lilly, Marlene was the first female promoted to Research Advisor and then to Lilly Research Fellow, a title held by fewer than 10 scientists in the Lilly Research Laboratories in the 1990s. Marlene's research focused on the pharmacology of serotonin receptors, particularly as related to cardiovascular and neuropsychiatric disorders. She received numerous awards throughout her career, and is an ISI highly cited author. Marlene cofounded and is currently Vice-President of Creative Pharmacology Solutions, LLC, providing consulting services on the drug discovery process for chemical and biotechnology companies and on drug-related topics for legal firms.

Elaine Sanders-Bush, the most recent woman ASPET President, received her undergraduate degree from Western Kentucky State College in Bowling Green (now Western Kentucky University) and her Ph.D. in pharmacology from Vanderbilt University. She pursued postdoctoral studies in psychopharmacology at Vanderbilt, where she rose through the academic ranks to Professor and currently serves as Director of the Vanderbilt Brain Institute and Director of the Graduate Program in Neuroscience. Elaine's work has focused on serotonin and serotonin receptors, and she has contributed significantly to our understanding of receptor function and modulation by RNA editing, particularly as related to the action of the antidepressants. Elaine served on the ASPET Board of Publications Trustees and has received numerous awards throughout her career for her contributions in research as well as teaching.



Marjorie Horning
(1984-1985)



Eva King Killam
(1989-1990)



Sue Piper Duckles
(1997-1998)



Marlene L. Cohen
(2001-2002)



Elaine Sanders-Bush
(2006-2007)

Fig. 4 Women Presidents of ASPET. The number in parentheses is the year the individual served.

Women have also served as Secretary/Treasurer of ASPET since 1975 (Figure 5). As Secretary/Treasurer, these women also chaired the ASPET Finance Committee. Interestingly, women have held this position consecutively since 2001.



Ruth Levine
(1975-1976)



Marjorie Horning
(1981-1982)



Mary Vore
(1987-1988)



Nancy R. Zahniser
(2001-2002)



Cinda J. Helke
(2003-2004)



Patricia K. Sonsalla
(2005-2006)



Lynn Wecker
(2006-2007)



Annette E.
Fleckenstein
(2007-2008)



Susan G. Amara
(2008-2009)

Fig. 5 Women Secretary/Treasurers of ASPET. The year served or to be served is in parentheses.

Women have also held the position of Councilor of ASPET. Council represents the leadership/governing board of ASPET and is charged with administering the affairs of ASPET, including financial, scientific, and publishing activities. Three councilors elected by ASPET members serve to represent members on ASPET Council. Although the number of women elected to this position has remained relatively constant (2 per decade) since 1973 (Table 3, Figure 6), it should be noted that only seven female councilors have been elected during this 32-year period.



Eva King Killam
(1973-1976)



Jean M. Marshall
(1977-1980)



Janice Stickney
(1984-1987)



Paula Stern
(1989-1992)



Sue Piper Duckles
(1992-1995)



Lee E. Limbird
(1995-1998)



Patricia K. Sonsalla
(2002-2005)

Fig. 6 Women Councilors of ASPET. The numbers in parentheses are the years the individual served.

Table 3. Female Officers of ASPET

| Position | Name | Years |
|---------------------|-------------------------|--------------|
| President | Marjorie Horning | 1984-1985 |
| | Eva King Killam | 1989-1990 |
| | Sue Piper Duckles | 1997-1998 |
| | Marlene L. Cohen | 2001-2002 |
| | Elaine Sanders-Bush | 2006-2007 |
| Secretary/Treasurer | Ruth Levine | 1975-1976 |
| | Marjorie Horning | 1981-1982 |
| | Mary Vore | 1987-1988 |
| | Nancy R. Zahniser | 2001-2002 |
| | Cinda J. Helke | 2003-2004 |
| | Patricia K. Sonsalla | 2005-2006 |
| | Lynn Wecker | 2006-2007 |
| | Annette E. Fleckenstein | 2007-2008 |
| | Susan Amara | 2008-2009 |
| Councilor | Eva King Killam | 1973-1976 |
| | Jean M. Marshall | 1977-1980 |
| | Janice Stickney | 1984-1987 |
| | Paula Stern | 1989-1991 |
| | Sue Piper Duckles | 1992-1995 |
| | Lee E. Limbird | 1995-1998 |
| | Patricia K. Sonsalla | 2002-2005 |

Committee and Division Chairs

Over the years, Council formed many committees to address specific interests and issues relevant to the Society. In addition to women paving their way on Council, women were integral members of the committee structure and later, the Divisions of ASPET. By the latter half of the 1970s, women began to serve as Committee Chairs, and once the Division structure was initiated in the 1980s, women were frequently elected to chair these Divisions. The female Chairs of ASPET Committees and Divisions, along with their terms served, are listed on Tables 4 and 5, respectively. As with Councilors, although women have served as Chairs, in most cases, women represent only a relatively small fraction of the Committee Chairs over the years based on the long duration that many of the committees have been in existence. Clearly, as women were elected to all these positions, their influence on the Society and their leadership continued to increase.

Table 4. Female Chairs of ASPET Committees

| Committee | Name | Years |
|--|-------------------------|--------------|
| Affirmative Action in Pharmacology & Experimental Therapeutics: Education and Career Development Subcommittee (1982-1985) ¹ | Yvonne Harrison | 1985-1987 |
| Awards Committee (1976-1999; 2006-present) | Joanne I. Moore | 1985-1986 |
| B. B. Brodie Award Committee (1999-present) | Mary Vore | 1999-2000 |
| Committee on the Care & Use of Animals (CCURA) (1985-2002) | Diana Krause | 1999-2002 |
| Educational Affairs Committee (prior to 1959-1990) | Ruth R. Levine | 1980-1983 |
| | Sue P. Duckles | 1992-1993 |
| Committee | Name | Years |
| Graduate Recruitment & Education | Rochelle Schwartz-Bloom | 1996-1999 |

SPECIAL CENTENNIAL ARTICLE

| | | |
|---|----------------------------|-----------|
| Committee (1990-present) | Barbara S. Beckman | 2002-2005 |
| | Stephanie W. Watts | 2005-2007 |
| Membership Committee (prior to 1959-2001) | Barbara R. Rennick | 1976 |
| | Harriet M. Maling | 1977 |
| | Mary Vore | 1982 |
| | Joanne I. Moore | 1983 |
| | Janice L. Stickney | 1984 |
| | Mary Vore | 1985 |
| | Sue P. Duckles | 1988 |
| | Elaine Sanders-Bush | 1990 |
| | Marlene L. Cohen | 1992 |
| | Lee E. Limbird | 1993 |
| | Dolores C. Shockley | 1996 |
| | Maria Almira Correia | 1999 |
| | Margaret E. Gnegy | 2000 |
| | Lorraine Gudas | 2003 |
| Minorities Committee/Subcommittee (1985-2005) | Margarita L. Dubocovich | 2002-2005 |
| | Yvonne E. Harrison | 1985-1990 |
| | Dolores C. Shockley | 1990-1994 |
| Nominating Committee (prior to 1959-present) | Marilyn E. Hess | 1976 |
| | Joanne I. Moore | 1978 |
| | Paula H. Stern | 1981 |
| | Doris H. Clouet | 1982 |
| | Marlene L. Cohen | 1984 |
| | Elaine Sanders-Bush | 1993 |
| | Lynn Wecker | 1994 |
| | Bettie Sue Masters | 1995 |
| | Bettie S. Masters | 1995 |
| | Joanne I. Moore | 1997 |
| | Joan Heller Brown | 1998 |
| | Elaine Sanders-Bush | 1999 |
| | Kathryn A. Cunningham | 2000 |
| | Suzanne Laychock | 2001 |
| | Marlene L. Cohen | 2003 |
| Elaine Sanders-Bush | 2008 | |
| Preprofessional Education Subcommittee (1980-2001) | Joan M. Lakoski | 1991-1997 |
| | Barbara S. Beckman | 1999-2002 |
| Program Committee (prior to 1959-present) | Lynn Wecker | 1998-2005 |
| Public Information Committee/Subcommittee (1982-2004) | Mary Vore | 1985-1986 |
| | Janice L. Stickney | 1981-1985 |
| Short Course/Continuing Education Subcommittee (1999-2004) | Rochelle D. Schwartz-Bloom | 1999-2003 |
| Teaching and Evaluation Materials Subcommittee (1985-1995) | Patricia B. Williams | 1991-1993 |
| Teaching of Pharmacology to Undergraduates & Non-professionals Subcommittee (1974-1980) | Ruth R. Levine | 1974-1975 |
| | Ruth R. Levine | 1979-1980 |

The numbers in parentheses denote the years the committee existed.

Table 5. Female Chairs of ASPET Divisions

| DIVISION | NAME | YEARS |
|--|------------------------------|-----------|
| Behavioral Pharmacology (1999-present) ¹ | Linda Dykstra | 2004-2005 |
| | Alice M. Young | 2005-2007 |
| Cardiovascular Pharmacology (1997-present) | Mariana Morris | 2004-2006 |
| | Nancy J. Rusch | 2006-2008 |
| | Debra Diz | 2008-2010 |
| Developmental Pharmacology Section (1984-1991) | Antonia Vernadakis | 1985-1987 |
| Drug Metabolism (1972-present) | Mary Vore | 1990-1992 |
| | Bettie Sue Masters | 1993-1994 |
| Molecular Pharmacology (1997-present) | Dianne M. Perez | 2005-2006 |
| Neuropharmacology (1988-present) | Patricia K. Sonsalla | 1997-2000 |
| | Marie Francoise Chesselet | 2002-2004 |
| | Kathryn Cunningham | 2004-2005 |
| Toxicology (1997-present) | Linda Birnbaum | 1999-2000 |
| | Elizabeth Jeffrey | 2001-2002 |

¹Several of these Divisions were in existence as sections prior to achieving formal Division status; the numbers in parentheses denote the year the Division was founded.

Women in Pharmacology Subcommittee

Based on growth in the number of women in the Society during the 1970s, ASPET formed a new subcommittee in 1980 to provide a forum for the discussion of issues facing women pharmacologists. A similar group created by The American Physiological Society had been highly successful in raising the consciousness of that Society to issues relevant to women. Thus, Women in Pharmacology was established as a subcommittee of the Committee on Education and Professional Affairs, and in 1998 it became a full committee when the parent committee was dissolved as ASPET reviewed committee needs.

Mary Mycek was the founding chair of the Subcommittee, with Floie Vane serving as co-chair (Table 6, Figure 7). Initially, the subcommittee focused on identifying and addressing those issues relevant to the female population of pharmacologists in the Society and raising the awareness of ASPET to issues relevant to women. Importantly, the subcommittee provided a formal mechanism for women to meet each other, in particular during the annual meetings of ASPET. Over the years, the subcommittee initiated symposia, workshops and mixers that focused on mentoring, dual career issues, leadership roles, and the professional advancement of women. More recently, the group has been instrumental in nominating women for ASPET and FASEB Awards.



Fig. 7 Founding Chairs of the Women in Pharmacology Subcommittee (SWIP), later Women in Pharmacology (WIP) Committee

Table 6. Chairs of Women In Pharmacology Committee (WIP)

| Name | Years |
|------------------------------------|--------------|
| Mary Mycek Floie Vane, co-chair | 1980-1983 |
| Paula Stern | 1983-1985 |
| Marlene Cohen | 1985-1987 |
| Lora Rikans | 1987-1994 |
| Terriann Crisp | 1994-1995 |
| Suzanne Laychock | 1996-1999 |
| Linda Dwoskin | 1999-2002 |
| Joan Lakoski | 2002-2004 |
| Beth Levant | 2004-2005 |
| Laura Nisenbaum | 2005-2008 |

In 1987, the subcommittee, chaired by Marlene Cohen, with encouragement from the Executive Officer, Kay Croker, joined forces with the Women in Physiology, which was chaired by Helen Cooke, to initiate an award for female scientists. For the first three years, the initial awards alternated between physiology and pharmacology and involved a lecture at the annual meeting by the recipient and a plaque provided by the Society. However, the Subcommittee of Women in Pharmacology felt strongly that the recognition of women scientists should be expanded with a significant monetary award and might be broadened to include female scientists from other disciplines.

FASEB was approached with this suggestion, and a FASEB Women's Committee was formed. In December 1989, the FASEB Board approved the opportunity for women to enter discussions that might provide an annual stipend associated with the Award. In a letter from the executive director of FASEB to Kim Bottomly, chair of the FASEB Women's Committee dated December 6, 1989, the committee was "...cautioned that should the award exceed the \$10,000 range, it would be important to communicate first with the office. It is the intention of the Board to maintain a 3M Award of \$25,000 each year as the major scientific award of the Federation..." Thus, even into the 1990s, there was resistance to equalize and recognize female scientists, and it is to the credit of the dedicated women on this early committee (Kim Bottomly, Chair, Helen Cooke, Linda McManus, Lora Rikens, Phyllis Moser Veillon and Marlene Cohen) that the Excellence in Science Award came into being. Finally, this initial Pharmacology/Physiology Award was expanded to include women from all FASEB societies, and most importantly, Eli Lilly and Company agreed to sponsor the Award with an acceptable \$10,000 unrestricted research grant to support the recipient's research. Today, a FASEB committee chooses the recipient of the award annually. This was a significant achievement of the Subcommittee of Women in Pharmacology.

A second achievement by this group occurred in 1998 when the subcommittee became a full committee and began sponsoring formal sessions at the annual meeting. In 1998, the first career session was held entitled "Juggling Life and a Career in Science," and in 1999, the group sponsored a session entitled "It Takes a Village: Mentoring and Retaining Women in Science." In 2000, when ASPET held its annual meeting with the American Society for Biochemistry and Molecular Biology, women from both scientific societies got together at a Women Scientists Networking Session and Reception. The responses to these sessions were so positive that in 2001, the Women in Pharmacology Committee joined forces with the Women in Physiology to jointly program a career session at the annual meeting. These sessions have continued annually since that time (see Table 7) and have proven to be very popular with both men and women due to both the timeliness of the topics discussed and the format, which includes both short talks and breakout sessions.

In addition to these career sessions, the Women in Pharmacology Committee has also sponsored scientific sessions at the annual meetings on numerous topics including the pharmacological treatment of menopause, targeted therapeutics for breast cancer, drug abuse as a gender issue, gender differences in eating disorders, and pharmacogenomics.

Table 7. Joint Sessions at the Annual EB Meetings Sponsored by Women in Pharmacology and Women in Physiology

| Topic | Year |
|--|------|
| How to Get Published in PS and ASPET Journals | 2001 |
| How to be a Good Mentor | 2002 |
| Presentation Skills | 2003 |
| Life After the Ph.D.: Finding a Postdoctoral Fellowship | 2004 |
| Managing a Laboratory | 2005 |
| Mastering the Juggling Act: Laboratory, Life and Leadership Roles | 2006 |
| Being Heard: The Microinequities that Tilt the Playing Field | 2007 |
| Gainfully Employed: From Launching a Job Search to Navigating Negotiations | 2008 |

Recognition of Women in ASPET

ASPET has been quite proactive in recognizing the contributions and accomplishments of its members since 1947 with annual or biennial awards supported by a combination of Society funds and corporate or private donations. It is noteworthy that women have received only limited acknowledgement as recipients of these awards over the many years that they have been administered (Table 8, Figure 8).

ASPET initiated the John J. Abel Award in 1947 to recognize young scientists for their original research, independence of thought, originality of ideas, clarity and excellence in data presentation. This award has been presented to 59 scientists since its inception, with three awards to women. Eva King Killam was the first female recipient of this prestigious award in 1954, and 33 years elapsed before the next woman, Lee Limbird, was recognized. Susan Amara was the third woman to receive this award in 1993, over a period of 60 years.

The Pharmacia-ASPET Award has been given annually since 1969 to recognize and stimulate outstanding research in pharmacology and experimental therapeutics that has had, or will have, a major impact on the pharmacological treatment of disease. To date, 38 individuals have received this award, which has been given once to a woman, Susan Horwitz in 1994.

The Epilepsy Research Award was established in 1978 to recognize and stimulate outstanding research leading to better clinical control of epileptic seizures. Since its inception, this award has been presented to 22 researchers, of which one is a woman, Karen Gale.

The Bernard B. Brodie Award was initiated in 1978 to honor scientists working in the field of drug metabolism. It was not until 2000, that a woman, Bettie Sue Masters, was honored with the award.

ASPET initiated the Goodman and Gilman Award in 1980 to recognize outstanding research in the area of biological receptors. Most recently, two women have been honored as recipients of the Goodman and Gillman Award, Melanie Cobb and Lee Limbird.

The Julius Axelrod Award was initiated in 1991 by the Catecholamine Club to recognize significant contributions to understanding the biochemical mechanisms underlying the pharmacological actions of drugs, as well as for mentoring contributions. In 2007, ASPET became affiliated with this Award. One woman, Susan Amara, has received this award since its inception.

The Torald Sollman Award was initiated in 1961 to recognize sustained significant contributions to pharmacology over many years. Finally, in 2007, Sue Duckles became the first female recipient of this award. Sue was well deserving of this honor as she has had a major positive impact on ASPET and pharmacology, both nationally and internationally.

Thus, although women have made considerable progress in receiving recognition by the Society, it is clear that recognition has been sparse, although improving.



Eva King Killam
John J. Abel Award (1954)



Lee E. Limbird
John J. Abel Award (1987)
Goodman & Gilman Award (2004)



Susan G. Amara
John J. Abel Award (1993)
Julius Axelrod Award (1996)



Susan B. Horwitz
Pharmacia-ASPET Award for
Experimental Therapeutics (1994)



Karen N. Gale
Epilepsy Research Award (1995)



Bettie Sue Masters
Bernard B. Brodie Award (2000)



Melanie H. Cobb
Goodman & Gilman Award (2000)



Sue Piper Duckles
Torald Sollmann Award (2007)

Fig. 8. Women recipients of ASPET Awards. The award and year received are in parentheses

Table 8. Female Recipients of ASPET Awards

| Award (total # of awardees) | Recipient | Year |
|--|--------------------|------|
| John Jacob Abel Award (59) | Eva King Killam | 1954 |
| | Lee E. Limbird | 1987 |
| | Susan G. Amara | 1993 |
| Pharmacia-ASPET Award for Experimental Therapeutics (38) | Susan B. Horwitz | 1994 |
| Epilepsy Research Award (22) | Karen N. Gale | 1995 |
| Bernard B. Brodie Award (16) | Bettie Sue Masters | 2000 |
| Goodman & Gilman Award (14) | Melanie H. Cobb | 2000 |
| | Lee E. Limbird | 2004 |
| Julius Axelrod Award (14) | Susan G. Amara | 2006 |
| Torald Sollman Award (46) | Sue Piper Duckles | 2007 |

The Role of Women in ASPET Journals

ASPET established and has maintained several scientific and informational journals since 1909. To maintain the high standards and quality of these publications, the Board of Publications Trustees was established in 1949 and charged with the responsibility of overseeing the editorships of the Journals and approving decisions regarding new journals,

publishers, subscription rates, etc. During this time, there have been 14 chairs of this Board and none have been women. However, women have been sporadic members of the Board since 1975, as indicated in Table 9, and a woman has served on the Board continuously since 1998.

Table 9: Membership of Women on the Board of Publications Trustees

| Name | Years |
|---------------------|--------------|
| Jean M. Marshall | 1975-1977 |
| Bettie Sue Masters | 1983-1987 |
| Marlene L. Cohen | 1990-1992 |
| Elaine Sanders-Bush | 1998-2004 |
| Lorraine Gudas | 2003-2005 |
| Mary Vore | 2006-present |

The oldest ASPET journal, the *Journal of Pharmacology and Experimental Therapeutics*, was founded in 1909 by John J. Abel and was the first journal to recruit a female editor, Eva King Killam, in 1978. Eva instituted many new initiatives regarding submissions that expanded the prestige of the Journal.

In 1998, Joan Heller Brown accepted the position as Editor of *Molecular Pharmacology* and served in that capacity until 2002. Joan helped guide the Journal through the initial stages of electronic submission and availability.

Of course, Kay Croker, as Executive Director of ASPET, served as Editor of *The Pharmacologist* (the ASPET Newsletter and informational publication) from 1981 to 1997, and the current Executive Officer, Christine Carrico, assumed this position from 2000-2006.

Lastly, in 2001, ASPET took the bold step to start a new Journal, *Molecular Interventions*, under the leadership of Sue Duckles who chaired the Executive Committee charged with oversight of this Journal. Although not officially the editor of *Molecular Interventions*, it was through Sue's leadership that the Journal was conceived and initiated.

The Future

We think it is only fitting that the National Academy of Sciences released their latest report "Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering" in September 2006. While we have 'come a long way,' the report indicates clearly that we still have a long way to go in achieving gender equality in the sciences. Likewise, in ASPET, considerable progress has been made in gender equality, although the effort is by no means complete. We hope that this retrospective review on the role of women in ASPET will provide an historical perspective on women in ASPET and shed light on some of the general issues facing women. Through awareness of this knowledge, further and perhaps more rapid progress in leadership opportunities and advancement of women will transpire in the future. We believe the opportunities for influence and impact are expanding and welcoming for women in science and in ASPET, in particular.

References

- Appel, T. A. (1994) Physiology in American Women's Colleges: The Rise and Decline of a female Subculture, *Isis* 85: 26-56.
- Jagsi, R., Guancial, E.A., Worobey, C.C., Henault, L.E., Chang, Y., Starr, R., Tarbell, N.J. and Hylek, E.M. (2006) The 'Gender Gap' in Authorship of Academic Medical Literature -- A 35-Year Perspective. *New Engl J Med* 355:281-287.
- Lees, M. B. (2002) Participation of Women in Neurochemistry Societies *Neurocheml Research* 27:1259-1267.
- Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering*, Committee on Maximizing the Potential of Women in Academic Science and Engineering, National Academy of Sciences, National Academy of Engineering, and Institute of Medicine; September 2006
- Chen, K.K. (1969) *The American Society For Pharmacology And Experimental Therapeutics, Incorporated: The First Sixty Years 1908-1969*, Judd & Detweiler, Inc., Washington D.C.