

Early women ichthyologists

Patricia Stocking Brown

Department of Biology, Siena College, Loudonville, NY 12211, U.S.A.

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This paper is a brief summary of some of the women who have worked in the field of ichthyology or studied the biology of fishes in a somewhat broader area. All of the women included were born prior to 1920. It does not include Ethelwynn Trewavas since her life and work are covered in a detailed article by David Noakes. The list of women covered here is not meant to be complete, especially with respect to eastern Europe or Asia, and I welcome suggestions of additional women along with biographical information about them for future work.

For purposes of a broader discussion, I have placed these women into the following categories: those who worked in (1) museums of natural history, (2) higher education, (3) government, and (4) women who worked primarily with their husbands who were also zoologists or ichthyologists.

1. Museum work

Museums of natural history have offered special opportunities for a number of early women biologists. Since much of the initial occupation of biologists was with collecting and classifying organisms, museums often functioned as research centers for the discipline. As museums expanded their collections in the late 1800's and early 1900's, many employed women assistants to cope with the growth of the collections. As museums began to be open to the public, women would often be employed to develop the necessary exhibits. Once in such positions, these women might then have additional op-

portunities to do basic research using the museum collections.

Although research universities were seldom willing to offer women academic positions (and thus provide women with 'a lab of their own'), women could work on a volunteer basis in museums, do professional quality research, and eventually be given a title and be allowed partial or full participation in their discipline. Perhaps the most famous of these women zoologists who had a title but no paying position was the invertebrate zoologist, Libbie Hyman, who spent many years as a Research Associate at the American Museum of Natural History. Hyman supported herself during this time from what eventually became the very minimal royalties earned from her comparative anatomy text. This kind of volunteer but self-directed work would seem to require a field with minimal requirements for expensive research equipment. Thus, work in anatomy and taxonomy on existing museum collections could provide special opportunities for those who commanded few resources. A striking feature of the women described here was their willingness to put their own work aside and help their male colleagues. Both Grey and LaMonte had skill with languages which both gave them access to the scientific literature of other languages and made them particularly valued colleagues.

Additional women who worked in museums include Lillian Dempster (1905–1992) who worked at the California Academy of Sciences, Myvanwy M. Dick (1910–1993) who worked at Harvard University's Museum of Comparative Zoology, and Marga-

ret Mary Smith (1916–1987), the first director of the J.L.B. Smith Institute of Ichthyology (later incorpo-

rated as a national museum) and professor at Rhodes University in Grahamstown, South Africa.

Marion Griswold Grey (1911–1964)¹

- 1911** Born in Los Angeles, youngest of 3 children of James and Lucy Griswold
- 1929–1931** Attended Wellesley as member of class of 1933
- 1933** Married Arthur L. Grey, 14 September, and moved to Chicago
- 1935–1939** Three children born – Peter (b. 1935), Lucy (b. 1937) and Sarah (b. 1939)
- 1941** Began to work at Field Museum of Natural History, Chicago, as volunteer
- 1943–1946** In charge of Division of Fishes (unpaid) to Loren Woods' absence during World War II
- 1943–1964** Associate, Division of Fishes, Department of Zoology, Field Museum



Fig. 1. Marion Griswold Grey. Photograph courtesy of the Field Museum of Natural History, Chicago.

Marion Griswold was born in Los Angeles and moved with her family to Kenosha, Wisconsin when she was nine. She was her father's favorite child and he was a powerful moral influence in her life. From the age of twelve, she wanted to be a writer. Marion's formal education consisted of two years of study in Zoology at Wellesley College. She withdrew from Wellesley because, as she later told her children, many of her friends had had to leave school when their fathers went bankrupt during the Depression, and Marion felt guilty about remaining. Her connection with the Field Museum began when she collected a pipefish on the Maryland shore and brought it to Alfred Weed at the museum to identify. He encouraged her to work at the museum as a volunteer. According to her daughter, 'for the rest of her life, with her husband's grudging permission, she spent every Wednesday at the Mu-

seum and much of her free time at home, hunched over a desk inspecting specimens or reading or writing about fish'.

Although she was informally educated by a number of colleagues at the museum (Alfred Weed, Loren Woods), her main inspiration came from Karl Schmidt, Chief Curator of Zoology. Only two years after she began her work there, Loren Woods left to serve in the Navy and Karl Schmidt asked Marion to take charge, with the title 'Head of the Fish Division'. It is said that she was paid \$ 2.50 per month to cover her transportation to work.

Her research started with the preparation of a *Catalogue of Type Specimens of Fishes in the Chicago Natural History Museum* which was published in 1947. In the summer of 1948 she was a member of the museum's expedition to Bermuda. According to her daughter, this was probably the high point in

¹ Information supplied by letters to P.S. Brown from Margaret Bradbury (25 January 1987); from Marion's daughter, Sarah Grey Thomason, Professor of Linguistics, University of Pittsburgh (1 March 1987; 13 April 1987); and from Myvanwy Dick (1987); a letter to Margaret M. Stewart from John Clay Bruner, 24 June 1986 and an obituary by Rand, A.L. 1964 in *The Bulletin*, Chicago Natural History Museum. p. 1, 8.

her career for sheer enjoyment. Marion taught herself Russian so she could read the Russian ichthyological literature and she generously translated papers for her colleagues. She entered into a lively correspondence with deep-sea fish workers in Europe, Russia, Japan and elsewhere. In 1953 she presented a paper at the International Zoological Congress in Copenhagen. Two of her most important contributions are *The distribution of fishes found below a depth of 2,000 meters* published in 1956, and *Family Gonostomatidae*, published in Part IV of *Fishes of the Western North Atlantic* which appeared in 1964. She published 21 papers between 1945 and 1964.

Her accomplishments are especially significant considering her lack of formal training, her responsibility in the raising of her family, the limited time

she was able to devote to this work (she went to the museum only one day per week for many years) and her relatively short life. Marion had a modest opinion of her own ability and work. According to her daughter, Marion believed that men tended to be more intelligent than women and that women should be careful not to offend men by appearing to be more intelligent. It was not until just before she died that she was finally convinced that the quality of her work was as meritorious as that of her male colleagues. Marion was regarded as a warm-hearted, helpful and generous woman scientist with tremendous enthusiasm and an ever-questioning mind by those that worked with her at the museum and were her colleagues elsewhere. She died at the age of 52 from a series of strokes.

Francesca Raymond LaMonte 1895–1982²

1895	Born in Bensberg, Germany
1918	B.A. and Certificate of Music, Wellesley College
1920	Assistant on Bibliography of Fishes, American Museum
1925	Secretary, Department of Ichthyology, American Museum
1928	Assistant in Ichthyology, American Museum
1929	Assistant Curator of Ichthyology, American Museum
1930	One of five official U.S. representatives to International Zoological Congress in Padua, Italy
1935	Associate Curator, Department of Living and Extinct Fishes
1943	Associate Curator of Fishes and Museum Secretary of International Game Fish Association
1962	Associate Curator Emeritus



Fig. 2. Francesca Raymond LaMonte weighing swordfish ovaries on the Lerner-Cape Breton Expedition, summer 1936. Photograph courtesy of the American Museum of Natural History, New York.

² Information supplied to P.S. Brown by Carla Stewart, Wellesley College Archive, January 1987 and by James Atz, American Museum of Natural History, 8 December 1986 and 4 April 1987.

Little is known regarding how family, school or college influenced the development of Francesca LaMonte's interest in natural history. While she was growing up her family lived in Russia and England and vacationed in France and Italy. She went to school in Germany. Originally hired by the American Museum of Natural History to work on Dean's *Bibliography of Fishes* and as the department secretary, she put to good use her ability to translate French, German, Italian, Spanish and Russian. There is no complete bibliography available, but she is said to have published 86 articles and several books on fishes in addition to numerous transla-

tions. She participated in expeditions to Cape Breton (1936, 1938), Bimini (1937) and Peru-Chile (1940). She also did field work in South Carolina, Florida, Hawai'i, Brazil, and the Isle of Shoals. Her most extensive work was on the marlin and swordfish. She was responsible for many exhibits in the Fish Hall, including the 'Life History of Swordfish', 'Life History of Eels', 'Life History and Migration of the Salmon' and 'West Indies Fishes'. Her hobby was also big-game fishing. After LaMonte retired in 1962, she spent 15 years reading and recording for the blind before retiring to Biloxi, Mississippi.

Erna Mohr 1894–1968³

- 1894** **Born in Hamburg, Germany**
- 1914–1934** **High school teacher**
- 1914** **Published first scientific paper**
- 1934** **Head of Fish Biology Department,
Zoologisches Staatsinstitut und
Zoologisches Museum Hamburg**
- 1936** **Head, Department of Higher
Vertebrates, Zoologisches Museum**
- 1944** **Member of Kaiserliche-
Leopoldinische-Karolinische
Akademie der Wissenschaften, Halle**
- 1946** **Curator of the Vertebrate
Department**
- 1950** **Honorary doctorate, Universität
München**

Erna Mohr, the daughter of a high school teacher, became interested in natural history during childhood. Little is known regarding her formal education. For 20 years she taught at a series of high



Fig. 3. Erna Mohr. Photograph courtesy of Hamburg Zoologisches Museum.

schools, including one for children with special needs.

³ Information from Herre, W. 1968. Erna Mohr. Rede zur Trauerfeier. *Zeitschrift für Säugetierkunde* 33: 256–261 (translated by Timo Jarrell); Hubbs, C.L. 1969. Erna Mohr 11 July, 1894–September 10, 1968. *Copeia* 1969: 64; Kosswig, D. 1969. Dr. h.c. Erna Mohr, 11.7.1894–10.9.1968. *Mitt. Hamburg Zool. Mus. Inst.* 66: 7–23 (includes full citation of 408 publications).

During the time she was teaching school, she published many articles in popular science magazines. She also pursued research, presumably on a volunteer basis, at the Zoological Museum in Hamburg. She first worked with Professor Ehrenbaum in the Fish Department on problems of fish growth, reproduction and feeding. According to Wolf Herre, she was the first person to determine the age of fish by their ctenoid scales. She later began to work with Professor Dunker on fish systematics. They described the fishes taken by the *Südsee-Expedition der Hamburgischen Wissenschaftlichen Stiftung 1908–1909*. According to Carl Hubbs, her revisionary studies of synantognathous fishes, particularly the viviparous halfbeaks, and of the Ammodytidae and Centriscidae were especially noteworthy. This work led to international recognition.

When Professor Dunker retired in 1934, Mohr became head of the Fish Biology Department. In 1936 she was put in charge of the Department of Higher Vertebrates. She was responsible for exhib-

its as well as collections in these departments. In addition to her work in the Hamburg Museum, she became a spokesperson for museums throughout Germany and helped in their development.

Erna Mohr had always been interested in living animals and took many photographs and studied the behavior of numerous mammals in zoos. As this interest developed she began to study the systematics, breeding and preservation of reindeer, the European bison, and the Przewalski wild horse, as well as other species. In addition, she began to study the behavior of mammals both in captivity and in the natural habitat.

Her encouragement of a number of young scientists and her broad interests in natural history, museums, collections, zoos, mammalian behavior, fish systematics, and species preservation – combined with her warm and considerate personality – won her a following from numerous scientists and lay people. She published over 400 articles.

Canna Maria Louise Popta 1860–1929⁴

1860	Born, probably in Leiden
1895	Member of Dutch Zoological Society
1898	Doctorate from University of Bern
1889	Lab Assistant to curator of reptiles, amphibians and fishes, Rijksmuseum van Natuurlijke Historie, Leiden
1891	Curator of Fishes, Rijksmuseum van Natuurlijke Historie
1928	Retired, age 68

Canna Popta was one of the first women to study at Leiden University, where she obtained a degree in geology, zoology and botany. This degree allowed her to teach in high school. She earned her doctorate in Switzerland at the University of Bern. Her



Fig. 4. Canna Popta. Photograph supplied by Rijksmuseum van Natuurlijke Historie, Leiden, The Netherlands.

thesis was done in the field of botany (a study of *Hemiasci*) with E. Fischer as her major professor. After obtaining her position at the museum, she concentrated on the study of fishes. She was known to be extremely helpful to any visiting scientists at

⁴ Biographical information and list of Popta's publications supplied to P.S. Brown by Marinus S. Hoogmoed, with the assistance of M.K.P. van Oijen, 23 February 1987.

the university – putting her own work aside com-

pletely until the visitor left. She published over 40 papers and several articles for encyclopedias.

Margaret Hamilton Storey 1900–1960⁵

- 1900** Born in San Francisco, 31 July 1900
1922 A.B. at Cornell
1932–1935 Assistant Bibliographer of Fishes,
 American Museum of Natural
 History
1936 A.M. at Stanford
1936–1940 Stanford Natural History Museum,
 Volunteer Researcher
1940–1960 Assistant Curator of Zoological
 Collections, Stanford Natural History
 Museum
1937–1942 Secretary, Western Division
 American Society of Ichthyologists
 and Herpetologists (ASIH)
1941 President, Western Division ASIH

Margaret Storey's parents, Thomas Andrew Storey and Parnie Hamilton, both graduated from Stanford University. Margaret had two younger sisters who became M.D.'s. After obtaining her A.B. degree from Cornell she worked in the theatre as a stage manager. Apparently she was able to use this training in organization and management to plan scientific events later in her career. Margaret also had a long-life interest in athletics. She became the only woman officially appointed a timer of intercollegiate track events. Margaret returned to the west coast and began working at the Stanford Museum as a volunteer. At the insistence of George Myers, Margaret was given a regular staff appointment in 1940.

According to Myers, 'Margaret soon became the busiest and most useful person in the Zoological Di-



Fig. 5. Margaret Storey. Photograph by R.S. Ferris.

vision. She acted not only as curator, but also as librarian of the growing zoological library, and editor of *Stanford Ichthyological Bulletin* and *Occasional Papers*, but also as counsellor and helpful assistant to everybody – faculty, graduate students and visiting investigators alike . . . Margaret's research was done mostly before she became a staff member. After that she was too busy . . . although she published comparatively little, few people have ever done so much to further ichthyology, herpetology and zoology; she constantly sacrificed her interests to those of others. She was probably one of the ablest curators of a large zoological research collection in the world. Almost every active American ichthyologist and herpetologist of the past 25 years owes much to her'.

⁵ Information from Myers, G.S. 1961. Margaret Hamilton Storey. *Copeia* 1961: 261–263 (includes her publications).

2. Work in higher education

Since the early part of the twentieth century, academic positions in U.S. universities and colleges have required earning a doctorate. Many women earned doctorates in zoology from U.S. graduate schools between 1896 and 1930. For instance, 97 women earned zoology doctorates during this time-period from just six institutions: 26 from Cornell, 9 from Yale, 14 from the University of California at Berkeley, and 16 each from Columbia, Pennsylvania and Chicago. Of these 97 women, only two secured positions at institutions similar to ones where they had done their own graduate work – i.e. Ph.D. granting universities. This contrasted sharply with the careers of the 192 men who earned Ph.D.'s from these same schools during the same time period, 68% (130) of whom found positions in Ph.D. granting institutions. Most of these highly credentialed women scientists who chose to remain in higher education could find positions only in women's colleges, normal schools or high schools – institutions unable to supply the necessary resources for re-

search. In the examples of Grace Pickford, Cornelia Clapp and Grace White there are a number of patterns typical of early women zoologists with doctorates. In spite of the impeccable credentials of both Clapp and White, both taught at women's colleges and were apparently never offered positions at graduate universities. What this meant was that they never had doctoral students of their own and so were unable to influence the field through their training of subsequent generations of graduate students. In spite of this, many of Clapp's students went on for doctoral degrees but could not add significantly to her academic genealogy because they themselves could not find positions where they could mentor doctoral students. Grace Pickford is highly unusual in that she eventually became a professor at Yale. In spite of Pickford's formidable accomplishments in zoology, however, one should note that she first taught many years at a women's college (Albertus Magnus), and that her first faculty appointment at Yale came 28 years after she had earned a doctorate.

Grace Evelyn Pickford 1902–1986⁶

- 1902** Born in Bournemouth, England
1923 Natural Sciences Tripos, Pt. I, Cambridge University (equivalent to a B.A. degree, which was not then granted to women)
1925 Married G. Evelyn Hutchinson
1925–1927 Travelling scholar of Newnham College, Cambridge in South Africa
1931 Ph.D. at Yale University
1934–1946 Research Assistant, Bingham Oceanographic Laboratory, Yale University
1934–1948 Assistant Professor, Albertus Magnus College
1937 Naturalized U.S. citizen
1946–1966 Research Associate, Bingham Oceanographic Laboratory
1951 Member, Danish *Galathea* Expedition
1959–1969 Associate Professor of Biology, Yale University
1969–1970 Professor of Biology, Yale University
1970–1986 Distinguished Scientist in Residence, Hiram College, Ohio
1980 Pickford Medal established
1981 Awarded Wilbur Lucious Cross Medal by Yale



Fig. 6. Grace E. Pickford on *Galathea* Expedition, 1951.

Grace Pickford was encouraged by her father to study natural history in the area around Bournemouth, England, where she grew up. Her mother believed in career opportunities for women and encouraged Grace to attend Cambridge University. Grace's passion for biology was shown while at Newnham College where she had published one paper and written three others before leaving College. At Cambridge she was founder of the Biological Tea Club, a small undergraduate group, which at that time included Evelyn Hutchinson, Gregory Bateson, Omer-Cooper and Michael Perkins. They

met weekly to discuss their own papers. After her marriage to G.E. Hutchinson, she had an opportunity to go with him to South Africa. There she began to work on earthworms and freshwater oligochaetes, and collaborated on limnological studies with Hutchinson. She then went with him to Yale, where she continued her taxonomic and zoogeographic work on oligochaetes as a doctoral dissertation. This work was published in 1937 as a 612 page monograph. Although her marriage to Hutchinson ended in 1934, they remained life-long friends.

After earning her Ph.D., she held two half-time

⁶ Information provided by Atz, J.W. 1970. Grace Pickford retires. *Discovery* 6: 41–43; Ball, J.N. 1987. In Memoriam, Grace E. Pickford (1902–1986). *Gen. Comp. Endocrinol.* 65: 162–165; Obituary in Newnham College Roll Letter by Anna Bidder and Penelope Jenkin; Brown, P.S. Interview with G.E. Pickford, 12 August 1981; Pickford, G.E. 1973. Introductory remarks. *Amer. Zool.* 13: 711–717.

positions – a teaching position at Albertus Magnus (a Catholic women's college), and a research assistantship at the Bingham Oceanographic Laboratory. In 1949 she began full-time work at the Oceanographic Lab. She studied cephalopods, publishing more than 20 papers between 1936–1974, and became recognized as the world's authority on the taxonomy and anatomy of octopods. It was this work that led to her discovery that the deep-sea cephalopod, *Vampyroteuthis*, is a living fossil, occupying a unique position between squids and octopuses. This, in turn, led to an invitation to join the Danish *Galathea* Expedition to study living *Vampyroteuthis*. The octopus genus *Pickfordiateuthis* Voss, 1953, is a tribute to her contributions in this field.

Her work with fish did not start until the 1940's and grew from her participation in a World War II project to study the possibility of using so-called 'trash fish' as a food source. She became interested in fish growth and collaborated in a series of studies with A.E. Wilhelmi on the role of hormones in this process. These studies were some of the first on fish hormones and helped to establish the field of comparative endocrinology. A 613 page monograph published in 1957, *The Physiology of the Pituitary Gland of Fishes*, by G.E. Pickford and J.W. Atz is considered an early and still enormously useful classic in this field. Possibly her most important con-

tribution to the evolutionary studies of hormone function was her observation that the killifish, *Fundulus heteroclitus*, requires the pituitary hormone, prolactin, in order to maintain osmotic balance in fresh water. This observation led to 30 years of further work by numerous laboratories, documenting the varied uses to which prolactin has been put during vertebrate evolution.

Grace Pickford was the author or coauthor of 135 publications, of which 78 were concerned with fish. In spite of her life-long accomplishments in research (3 distinct animal groups and including the fields of anatomy, taxonomy, zoogeography and endocrinology), recognition came relatively late in her career. The comparative endocrinologists recognized her contributions by establishing the Pickford medal in 1980. She was awarded the Wilbur Cross Medal by Yale in 1981. Her appointment to Full Professor at Yale occurred in 1969, at age 67. She retired from Yale in 1970 but continued to maintain an active research program at Hiram College in Ohio. Grace had a number of undergraduate, masters, doctoral, and post-doctoral research students and collaborated with many other colleagues world-wide. Those who knew Grace as a teacher or colleague felt privileged to share in her tremendous enthusiasm for the study of zoology and her dedicated friendship.

Cornelia Maria Clapp 1849–1934⁷

- 1849** **Born in Mantague, Massachusetts**
1868–1872 **Student, Mount Holyoke Seminary**
1888 **Ph.B. at Syracuse University**
1889 **Ph.D. at Syracuse University**
1896 **Ph.D. at University of Chicago**
1872–1896 **Teacher, Mount Holyoke Seminary**
1896–1916 **Professor, Mount Holyoke College**
1906 **Elected Trustee, Marine Biological
Laboratory (first woman and only
woman trustee until 1950)**
1910 **Designated one of the 150 most
important zoologists by ‘American
Men of Science’**



Fig. 7. Cornelia Clapp. Photograph courtesy of the Marine Biological Laboratory, Woods Hole, Massachusetts.

Cornelia Clapp is one of the most interesting and energetic of the early women zoologists who spent her career teaching in a women's college. She earned both the first and the second zoology doctorate granted to women in the United States, attended the Anderson School of Natural History at Penikese Island in 1874 where she initiated life-long friendships with zoologists, such as David Starr Jordan and C.O. Whitman. She, along with Rosa Smith Eigenmann, went with David Starr Jordan on walking tours through the U.S. and Europe as one of 'Jordan's tramps'. She was the first Ph.D. student to do her work at the Marine Biological Laboratory (MBL) in Woods Hole where she worked with Whitman. Her doctoral research was on the lateral line system of the toadfish and was published in the *Journal of Morphology*. From 1888 to 1922 Clapp spent her summers at the MBL, conducting research primarily on fish development. During all of these years she brought one or more investigators or students with her from Mount Holyoke. Clapp was the MBL Librarian from 1893 to 1907, a Member of the Corporation from 1896 until the end of

her life, a member of the staff of the Embryology Class from 1896 to 1906, and Trustee from 1902–1904 and again from 1910 to 1922 and Trustee Emeritus, 1922–1934.

Her entire teaching career was spent at Mount Holyoke where she taught experimental courses in zoology before such an approach was used in most institutions. Many of her students went on to earn doctorates in zoology. Some returned to Mount Holyoke where they continued to maintain one of the strongest undergraduate zoology programs in the country for many decades. Of the women who earned doctorates in zoology from U.S. institutions prior to 1930, the largest percentage had undergraduate degrees from Mount Holyoke. Part of the success of this program was due to the tradition of taking several undergraduates to the MBL every summer where they were initiated into the scientific community.

That Clapp was an engaging and energetic individual can be seen from the many tributes to her by colleagues and former students when a laboratory building at Mount Holyoke was named for her. An

⁷ Information from Haywood, C. 1971. Cornelia Maria Clapp in *Notable American Women*, E.T. James, J.W. James & P.W. Boyer (ed.) Cambridge; unpublished address by E.G. Conklin at Centennial celebration of her birth 17 March 1949 at Mt. Holyoke; and Mt. Holyoke Alumnae Quarterly 1934, Vol. 19, p. 1–9.

example from Louise Baird Wallace: 'Her bounding vitality and thirst for knowledge were conta-

gious. I felt then and have felt ever since that I was never fully alive until I knew her'.

Edith Grace White 1890–1975⁸

- 1890** Born in Boston, youngest of six children
- 1912** A.B. at Mount Holyoke, majors in English and Zoology
- 1913** Research Assistant with Prof. Dahlgren at Princeton
- 1913** A.M. at Columbia
- 1918** Ph.D. at Columbia on electric organs in *Astroscopus guttatus*
- 1915–1916** Research Assistant, Princeton
- 1917** Laboratory Assistant, Milwaukee Downer College and Western Reserve University
- 1918–1920** Faculty Member, Heidelberg College, Ohio
- 1920–1923** Faculty Member, Shorter College, Georgia
- 1923–1958** Professor and Head of Department of Biology, Wilson College, Chambersburg, Pennsylvania
- 1929–1930** Research Fellow, Imperial University, Tokyo; Misaki Marine Lab, and the marine lab at Batavia, Java
- 1933–1947** Research Associate, Department of Fishes, American Museum of Natural History

E. Grace White was an English major at Mount Holyoke when she elected a zoology course from Cornelia Clapp. Clapp, one of the most outstanding college teachers of her time, influenced Grace White first to switch majors from English to Zoology, and then to pursue graduate work on fishes.

Once Grace White had completed her doctorate, she held a series of positions at small colleges. This pattern was typical for women who earned Ph.D.'s at this time. For instance, of the 16 women who earned doctorates from Columbia between 1909



Fig. 8. E. Grace White. Photograph courtesy of Wilson College.

and 1930, nine found positions in women's colleges and none obtained positions at Ph.D. granting institutions. The career path of White's male colleagues differed significantly. Of 18 men who earned doctorates from Columbia between 1909 and 1930, 11 obtained faculty positions at Ph.D. granting institutions while 3 remained at undergraduate institutions for their entire career. White remained at Wilson College (a women's college whose students were primarily the daughters of ministers) for 35 years.

⁸ Material supplied by Elaine Trehub, Mount Holyoke College Archives, 5 May 1987; Elizabeth Boyd, Wilson College Library, 29 April 1987; and James Atz, American Museum of Natural History, 3 October 1986.

White published two textbooks on genetics and general biology in the 1930's and 1940's which were widely adopted and went through several editions. In addition, she continued to do research at the American Museum, where she was eventually given the title of Research Associate. She began studies on elasmobranch anatomy and taxonomy and was invited to study sharks in Japan, China and Java in 1929–1930 by W.K. Gregory of the American Mu-

seum. This research resulted in several papers that evaluated the anatomy of dermal denticles, dentition, vertebrae, spiral valves and other aspects of shark morphology. She integrated this information with an analysis of previous classifications and suggested a partly original concept of the origin, history and adaptive radiation of cartilaginous fishes. This was published as a monograph in 1937.

Helen Irene Battle 1903–1994⁹

1903	Born in London, Ontario
1923	B.A. University of Western Ontario
1924	M.A. University of Western Ontario
1928	Ph.D. University of Toronto
1929–1934	Assistant Professor, Zoology, University of Western Ontario
1934–1949	Associate Professor, University of Western Ontario
1949–1972	Professor, University of Western Ontario
1956–1958	Acting Head of the Department
1961	Founding member and Vice President, Canadian Society of Zoologists
1962–1963	President, Canadian Society of Zoologists
1975	Selected by National Museum of Natural Science as one of 19 outstanding women scientists
1977	Fry Medal of Canadian Society of Zoologists
1977	JCB Grant Award of the Canadian Association of Anatomists

Except for her years at the University of Toronto, Helen Battle has lived her entire life in London, Ontario. Her first love was teaching and her teaching career spanned more than 50 years. She was considered one of Canada's most gifted teachers, teaching an introductory biology course to arts students as well as embryology to medical students and advanced courses to honours zoology students. Her



Fig. 9. Helen Irene Battle. Photograph courtesy of Donald B. McMillan, University of Western Ontario.

enthusiasm and interest in her students generated many life-long relationships. The respect and warmth her students and colleagues felt for her was demonstrated by a banquet organized in her honour 31 March 1967. At that time, a scholarship was funded in her name for zoology students.

In addition to teaching, Helen Battle maintained an active research program over many years. She

⁹ Information supplied to P.S. Brown by Donald B. McMillan, University of Western Ontario, 8 September 1986.

spent most summers at the Atlantic Biological Station in St. Andrews, New Brunswick where her work included the physiology and embryology of a number of fish species. She published 37 articles between 1926 and 1973. These included work on the embryology of goldfish, Atlantic salmon, zebrafish, goldeye, brown trout and lampreys.

She was committed to the development of a graduate program at the University of Western Ontario. She also was a founding member of the Canadian Society of Zoologists. Her life-long work for her students, the university and the profession was recognized by a series of honors including the Fry Medal, the JCB Grant Award and her selection as one of the 19 outstanding women scientists in Canada.

3. Government work

Both Emmeline Moore and Frances Clark started working in state conservation departments at a time when few biologists in these organizations had earned doctorates. As a consequence, their credentials were outstanding. During this time period, considering the growth of universities, men with these credentials would undoubtedly have been offered attractive academic positions. Moore was almost immediately given a position with major responsibilities when she was put in charge of the New York State Biological Survey.

Emmeline Moore 1872–1963¹⁰

- 1872** Born in Batavia, New York
1895 Graduated from Genesco Normal School
1895–1902 Taught school in Scottsville, Cattaraugus and Cooperstown, NY
1905 A.B. Cornell
1906 A.M. Wellesley
1906–1910 Instructor, Trenton New Jersey Normal School
1911 Exchange Professor, Huguenot College for Women, Wellington, South Africa
1914 Ph.D. Cornell
1914–1917 Instructor to Assistant Professor, Vassar College
1917–1919 Worked on Federal Government World War I project – primary food relations of fish
1920–1925 Investigator in Fish Culture for NY State Conservation Department
1926–1932 Director of Biological Survey, NY State Conservation Department
1928 President, American Fisheries Society (first woman)
1932–1944 Chief Aquatic Biologist, NY State Conservation Department
1939 Honorary Doctorate, Hobart College, Geneva, NY
1944–1945 Research Associate, Bingham Oceanographic Lab, Yale University



Fig. 10. Emmeline Moore. Photograph courtesy of Janet Moore Thornton.

Emmeline Moore was brought up on a farm in Batavia, New York. She showed an early interest in natural history and recalled, ‘I used to go the swamps every Sunday. I remember seeing my first cardinal flowers and ferns there’. After high school graduation she taught in various normal schools and women’s colleges for 20 years – taking time off to complete university degrees at Cornell and Wel-

lesley. Her strong interest in natural science and her intense curiosity led to a Ph.D. at Cornell (1914) under George Embury, who is considered the father of fish culture.

A war-time project led directly to her appointment as New York State’s first professional investigator in fish culture. This early work resulted in a series of papers on fish diseases. In addition, one of

¹⁰ Information from the following: Carlander, K.D. 1984. Trends in the role of women in the American Fisheries Society, *Fisheries* 9: 8–9; Heacox, C. Dr. Emmeline Moore. *The Conservationist*, p. 47; *American Fisheries Society Newsletter*, October 1963; *The Conservationist*, Oct–Nov 1963, p. 38; Interview by Johanna Daily with Florence Moore 12 October 1986; Scrapbook of newspaper clippings on E. Moore supplied by family member.

her first projects was a collaborative study (in the summer of 1920) with James Needham, Chauncy Juday, Charles Sibley and John Titcomb on all aspects of the biology, chemistry and physics of Lake George. This study, authorized by the New York State legislature to determine how to increase fish production in this lake, was a convincing success and approval was granted to continue and expand the biological survey to include the entire 60 000 miles of the N.Y.S. watershed. In 1926 Emmeline Moore was appointed Director of this survey.

The original study and subsequent 14 reports (all edited by Moore) published between 1926 and 1939 were the first and remain the most comprehensive scientific examinations of any state's water resources ever conducted. During these years, Emmeline created a bond with numerous universities

and colleges around the country by hiring and encouraging great numbers of students and faculty during the summer survey field expeditions. This training ground was important for many biologists who would later become well known in their fields.

In addition to her work on the biological surveys, Moore published technical papers on fish culture and fish diseases as well as many popular articles. After retirement from the N.Y.S. Conservation Department, Emmeline continued publishing, and was given many honors, including having the state research vessel named after her (*The Emmeline M*) in 1958. In retrospect, the careers of the scientists whom she encouraged as students, and the N.Y.S. Biological Survey, which has been relied upon by numerous scientists for the past 50 years, are the greatest tributes to this woman scientist.

Frances Naomi Clark 1894–1987¹¹

- 1894** Born near St. Edward, Nebraska
1918 A.B. Zoology, Stanford University
1918–1921 U.S. Bureau Commercial Fisheries, Lab Assistant for C.H. Gilbert
1921–1923 Assistant, California Division of Fish and Game
1924 M.S. University of Michigan
1925 Ph.D. University of Michigan
1925–1926 Teacher, San Jose Junior High School
1926–1941 California Department of Fish and Game, Assistant Fisheries Biologist, Senior Fisheries Researcher, Supervising Fisheries Researcher
1941–1956 Director, California State Fisheries Laboratory at Terminal Island

Frances Clark was the younger of two girls. Her older sister was Laura Clark Hubbs. Their father was



Fig. 11. Frances N. Clark. Photograph courtesy of Richard S. Croker.

a farmer in Nebraska who apparently did well enough financially to be able to retire while still in

¹¹ Information provided by Richard S. Croker to P.S. Brown, 1 June 1987 and 18 June 1987 including obituary written by Croker for the California Cooperative Fisheries Investigation, and retirement notice for Frances N. Clark published in California Fish and Game, July 1956 (42: 3); by Robert R. Miller to P.S. Brown, 17 February 1987 including list of Clark's publications and c.v.; and by Clark Hubbs in phone call to P.S. Brown, 23 February 1994.

his fifties. The family moved to California where both Laura and Frances attended Stanford University. Frances immediately began to work for the U.S. Bureau of Commercial Fisheries. Why Frances decided to go on for a Ph.D. is unclear, but it is thought that either N.B. Scofield, then Chief of Marine Fisheries, or William F. Thompson, a young biologist working at the U.S. Bureau of Commercial Fisheries, encouraged Frances to pursue a doctorate. She went to Michigan where she earned a doctorate with her brother-in-law Carl Hubbs. It is interesting that Frances was awarded a Ph.D. two years before Carl got his doctorate from Michigan.

After one year spent teaching, Frances Clark joined the California Department of Fish and Game. Although there apparently was a period of time where she was the only person in the department with a Ph.D., they were reluctant to appoint her to an administrative post because it was felt that the men would not tolerate a woman supervisor. This attitude apparently did not persist, however, because she served as the Director of the lab at Terminal Island for the 17 years prior to her retirement. Clark lists 62 publications from 1925 through 1962. Her doctoral thesis was on the life history of the grunion, but most of her other research dealt with the life history, dynamics and conservation of the California sardine. Under her leadership the Terminal Island Laboratory initiated research projects on anchovy, yellowtail, surf perch and kelp bass, and expanded the high seas tuna program. In addition to her work in California, she did survey studies in both Peru and New Zealand. In her positions as Senior and supervising Fisheries Researcher as well as Director of the Laboratory, she supervised and trained numerous other researchers who remained indebted to her.

4. Couples: women who worked with their husbands

Many productive men and women scientists have been married to scientists. In each case, what a person brings to the partnership varies, but often includes skills as an editor, artist, photographer, statistician, co-author, organizer, or field collector, as

well as being a colleague with whom to discuss science. Men in these partnerships have often held highly visible faculty and administrative positions, whereas the women have often held no title, received little or no pay and, as a consequence, have been almost invisible. Clearly, the husband's reputation and visibility was often enhanced by the increased productivity of two people. In the words of Joseph Needham, 'A man's shadow is lengthened by his own work, but also by the work of his wife and his students'. Frequently, what the men provided to their wives was access to the scientific community, space in a university or college laboratory, microscopes and other research materials, connections to colleagues, and opportunities to participate in scientific discussions in academic settings or at professional meetings. This acceptance by, and access to, the scientific community often appeared to require a connection through a spouse, father or brother since many single women with doctorates failed to gain such access.

Rosa Smith Eigenmann, Lucy Clemens, Laura Hubbs, Frances Miller and Marie Poland Fish represent several different career patterns of women who worked with their husbands. Although Rosa had no formal college degrees, her willingness to join David Starr Jordan on various collecting trips, to hold various jobs, and to identify new species of fish and publish papers on her own indicates that she was an independent spirit. Although she was the single- or joint-author on at least 40 papers, and continued her work after she was married and had several children, she completely stopped work on her own after family responsibilities became overwhelming. Of the couples discussed here, only Lucy and Wilbert Clemens had equivalent educational backgrounds, having both earned doctorates from the same department at Cornell. In spite of having two children, Lucy participated as a full partner in the research at the Pacific Biological Station where clearly they were working as collaborators. Laura Hubbs had both a B.S. and an M.S. degree, but they were in mathematics rather than biology. Her training in biology was through her work with her husband and his colleagues. Laura Hubbs coauthored a number of papers with her husband but did not become identified with a specific area of research of

her own. Similarly, Frances Hubbs Miller devoted herself primarily to facilitating her husband's research. However, Marie Poland Fish, who had no more formal training than Laura Hubbs or Frances Miller, carved out her own area of expertise. Although she followed her husband to Buffalo, Rhode Island, Washington, D.C. and back to Rhode Island, she worked on completely separate and independ-

ent projects. Of women who worked with their husbands omitted here, the best known is Margaret Mary Smith, wife of the J.L.B. Smith of the coelacanth fame. After his death in 1968 she became an independent ichthyologist and founder of the Institute, as mentioned in the first section of museum workers.

Rosa Smith Eigenmann 1858–1947¹²

- 1858** Born in Monmouth, Illinois, last of 9 children
- 1880** Published first scientific paper (age 22)
- 1880–1892** Studied with David Starr Jordan at Indiana University
- 1887** Married Carl H. Eigenmann
- 1887–1888** Studied the Agassiz South American Fish collection at Harvard
- 1888** Helped establish biological station in San Diego
- 1890** Curator of Fishes at California Academy of Sciences
- 1890–1902** 5 children – Margaret, Charlotte, Theodore, Adele and Thora
- 1895** Delivered public lecture on 'Women in Science' at National Museum in Washington, D.C.

Rosa Smith is considered the first woman ichthyologist in the United States. She moved from Illinois to San Diego with her family in 1876, attended the Point Loma Seminary there and a business college in San Francisco. Her family was in the newspaper business and Rosa became the first woman reporter on the *San Diego Union*. Always intensely interest-

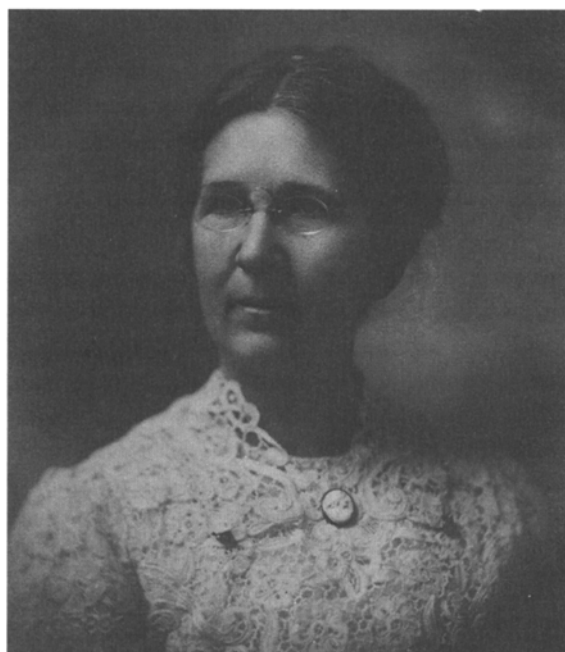


Fig. 12. Rosa Smith Eigenmann. Photograph courtesy of Hubbs Library.

ed in natural history, she happened to give a paper on a new species of fish she had discovered to the San Diego Society of Natural History while David Starr Jordan was there. He encouraged her to study with him at Indiana University, which she did for two years, living with his family during this time. She spent the summer of 1881 collecting in Europe

¹² Information primarily from Hubbs, C.L. 1971. Rosa Smith Eigenmann in *Notable American Women*, E.T. James, J.W. James & P.W. Boyer (ed.). Cambridge; from two unpublished biographical sketches written by two of their daughters, Thora Eigenmann (from the California Academy of Sciences) and Charlotte Eigenmann (from Indiana University Archives); Myers, G. 1928. Carl H. Eigenmann, Ichthyologist, *Natural History* 28: 98–101; Stejneger, L. 1938. Carl H. Eigenmann, 1863–1927. *National Academy of Science Biographical Memoirs* 18: 305–336, and Eigenmann, R.S. Women in Science, *Proceeding of the National Science Club*, 13–17 January, 1895. Ogilvie, M.B. 1986. Women in science. *Antiquity through the nineteenth century*. MIT Press, Cambridge.

with 'Jordan's tramps' – 34 of Jordan's students and colleagues. Due to family illness, she returned to San Diego before completing an undergraduate degree at Indiana. She continued to collect and correspond with Jordan and other ichthyologists. Through Jordan she met Carl Eigenmann and they were married in 1887. She was 28, four years Carl's senior. By the time of her marriage she had published a list of fish in the San Diego area, been requested by the Smithsonian Museum to make a collection of surf perch from the San Diego area, and published 10 single-authored primary papers in the *Proceedings of the U.S. National Museum*. Immediately after their marriage they left for Harvard where they had arranged to work on the mostly unstudied fish collections that Louis Agassiz had made in Brazil. They both spent part of the summer of 1888 at Woods Hole where the U.S. Fish Commission had a station. During this time they completed several short papers, in addition to a 500 page review of the South American catfishes. Carl and Rosa returned to California in 1889 and together established a biological station in San Diego where they continued their work on fish of the region. They both had appointments as curators at the California Academy of Sciences. In 1891, Jordan had Carl Eigenmann appointed as his replacement as Professor of Zool-

ogy at Indiana University when Jordan accepted the position of President of Stanford University. Between 1880 and 1893 Rosa published 37 papers – 12 single-authored and 25 co-authored with her husband. Her last publication was in 1891 and was co-authored. The Eigenmanns had five children. Because one son became mentally ill and one daughter was retarded, raising the family was especially difficult. Rosa retired from active research after 1893 to care for their children. Although she continued to edit Carl's papers, she did not accompany him on his later expeditions. Carl continued to be actively involved in research and his work included studies on the development and reproduction of viviparous fishes on the Pacific Coast, a series of papers on the blind cave vertebrates from southern Indiana and Kentucky, and monographs on the freshwater fishes of South America. In 1895 Rosa gave a lecture on 'Women in Science' at the Smithsonian Museum which was published. This lecture reveals her to be knowledgeable about other women scientists, concerned with the opening of education to women, aware of the conflict women had in doing science and raising a family and aware of the indirect and often unacknowledged contributions many women had made to science.

Lucy Wright Smith Clemens 1886–1937¹³

- 1886** Born in Sheffield, Massachusetts
1909 B.A. Mount Holyoke
1909–1910 Research Assistant, Carnegie Institute, Cold Spring Harbor
1911 M.A. Cornell
1914 Ph.D. Cornell
1912–1918 Instructor, Mount Holyoke
1918 Married Wilbert A. Clemens
1919, 1923 Son, Alvin, and daughter, Ann Morgan, born
1918–1937 Joint Director of Pacific Biological Station, Vancouver Island, British Columbia

Lucy Smith was the third generation of the Smith family to attend Mount Holyoke. She was encouraged by the Mount Holyoke faculty to pursue graduate work in zoology. At Cornell she studied limnology under J.G. Needham in the Entomology Department. Her fellow students included Emmeline Moore and Wilbert Clemens. After completing her doctorate, she returned to teach at Mount Holyoke. She married Wilbert Clemens of Toronto in June 1918 and they spent the summer on a collaborative study of the mutton fish, *Zoarces anguillaris* at the Atlantic Biological Station at St. Andrews. For several years Clemens was on the faculty at the University of Toronto and during the summers, set up a freshwater biological station at Lake Nipigon. Lucy and their children accompanied him during the field work in the summer months even though



Fig. 13. Lucy Smith Clemens, 1909. Photograph courtesy Mount Holyoke College.

the living conditions were relatively primitive. In 1924 Wilbert received an offer to be Director of the Biological Station at Departure Bay, Vancouver Island, British Columbia and after much agonizing, decided to accept it. Lucy fully participated in the work of the station including much of the research on salmon. She co-authored the annual reports on salmon with her husband that were published in the 'Report of the Commissioner of Fisheries for British Columbia' from 1925 until her death in 1937. She died when she was only 50.

¹³ Material furnished by Mount Holyoke College Archives and by G. Miller, Library, Pacific Biological Station, Nanaimo, British Columbia, including an unpublished autobiography of W.A. Clemens.

Laura Clark Hubbs 1893–1988¹⁴

1893 **Born near St. Edward, Nebraska**
1915 **B.S. Mathematics Stanford**
1916 **M.S. Mathematics Stanford**
1918 **Married Carl Hubbs, 3 children**
 Clark, Earl and Frances
1929–1944 **University of Michigan Museum of**
 Zoology, Cataloger, part-time

Laura Cornelia Clark was born in Nebraska in 1893, one year before her sister Frances Clark was born. The family moved to California and both Laura and Frances attended Stanford University. Although Laura studied mathematics at Stanford, after marrying Carl Hubbs, she devoted her life to collaborating with Carl in his work on fishes. While at the University of Michigan, Laura was on the Museum staff as a part-time employee. However, once Carl became a Professor at Scripps Institute of Oceanography in 1944, nepotism rules prevented Laura from holding a paid position. She continued to work but on a volunteer basis. She did the statistical work for Carl's publications, kept his scientific files, records and library in order, and collaborated on field work. She coauthored 19 of his publications. Two of



Fig. 14. Laura Hubbs next to Carl Hubbs measuring fishes at the University of Costa Rica in 1973. Photograph by E.K. Balon.

their children, Clark Hubbs and Frances Hubbs Miller, also devoted their lives to the study of fishes.

¹⁴ Information provided to P.S. Brown by Maria China at Hubbs-Sea World Research Institute (HSWRI), 23 February 1994; in August 1988 H-SWRI Newsletter, *Currents*; and by phone conversation with Clark Hubbs, 23 February 1994.

Frances Vorhees Hubbs Miller 1919–1987¹⁵

- 1919** **Born in Chicago**
1940 **B.S. Zoology, University of Michigan**
1940 **Married Robert Rush Miller**
1944–1954 **Five children – Frances, Gifford,**
Roger, Laurence and Benjamin
1980–1987 **Research Associate, University of**
Michigan Museum of Zoology



Fig. 15. Frances Hubbs Miller.

Frances Hubbs was the oldest child of Laura Clark Hubbs and Carl L. Hubbs. Fran not only grew up in a family where ichthyology was undoubtedly the main topic, she married ichthyologist Robert Rush Miller, and spent much of her life as a collaborator with her husband. Fran's contributions to their research included typing, cataloguing, recording data, data calculation, statistics, organizing field notes and data, and editing. One of their major collaborative research efforts was on the freshwater fishes of Mexico. This included field work in Mexico during 1972, 1974, 1976, 1978 and 1982, work at the U.S. National Museum during 1973–1974, and the organization of these data – all of which Fran was a participant. An additional project of her own was the publication of an annotated bibliography and subject index of her father's work.

¹⁵ Information from Chernoff, B. 1988. Frances Vorhees Hubbs Miller 1919–1987. *Copeia* 1988: 520–523.

Marie Poland Fish 1902–1989¹⁶

- 1902** Born in Paterson, New Jersey
1921 B.A. Smith College
1922–1927 Hydrobiologist, U.S. Bureau of Fisheries
1928–1931 Curator of Ichthyology, Buffalo Museum of Science
1928–1931 Senior Ichthyologist NYS Conservation Department, Investigation of Lake Erie
1931 Daughter Marilyn born
1931–1933 Research associate, Narragansett Marine Lab
1939–1942 State Ichthyologist for Rhode Island
1942–1943 Instructor of Zoology, Rhode Island State College
1944–1946 Research Associate in Ichthyology, US National Museum
1946–1948 Ichthyologist, Pacific Oceanic Biology Project
1948–1970 In charge of Office of Naval Research Project on ‘Underwater Sound of Biological Origin’, Narragansett Marine Laboratory, University of Rhode Island
1965 Navy Distinguished Public Service Award for basic research in marine bioacoustics



Fig. 16. Marie Poland Fish. Photograph courtesy of Marilyn Fish Munro.

Marie (Bobbie) Poland had intended to become a physician. After earning her B.A. degree at Smith College, she worked as a research assistant on cancer problems at the Department of Medical Research of the Carnegie Institute. In 1923 she married Charles J. Fish. Charlie Fish had earned a Ph.D. in 1923 at Brown University studying zooplankton. His major professor, Henry Bigelow – considered the father of oceanography – was at Harvard. Charlie first worked for the Bureau of Fisheries and then directed the Buffalo Museum of Science until 1935. In 1934 he joined the University of Rhode Island faculty. By 1936 he was a full professor in zoology and Director of the Narragansett Marine Laboratory, which he began. During World War II Charlie Fish served on the staff of the Chief of Naval Oper-

ations and Bobbie worked at the U.S. National Museum, classifying fishes. After the war, the couple returned to Rhode Island where Bobbie began to do research for the Navy on recording and identifying the sounds of over 100 marine coastal fishes. For 20 years after the war, Bobbie Fish directed the Navy’s principal project on biological marine sounds. She published approximately 200 articles including primary research articles and popular scientific work. For four years 1936–1939 she and her husband wrote semi-weekly newspaper columns on popular science but they did not collaborate on their scientific work. Bobbie Fish received the Navy Distinguished Public Service Award in 1966 for her extensive contributions to underwater sound production by marine animals. She passed away on 2 February 1989.

¹⁶ Information provided by Graduate School of Oceanography, University of Rhode Island.

Asian women in ichthyology have not been considered in the preceding review. In order to include at least some of them into this volume, we are showing on this and the following page, photographs of female ichthyologists from Japan, Thailand and the Philippines to represent them all.



Gathered under a sakura tree in full bloom on 31 March 1994 while attending the 27th Annual Meeting of the Ichthyological Society of Japan, are Dr. Midori Kobayakawa (second from left) of Kyushu University (who studies catfishes) with (left to right) graduate students Tomoko Seki and Yukiko Tanaka from the University of Tokyo (sharks), as well as Fujimi Fukuhara (barnacles), Miwako Kitade (zooplankton feeding by sea bream), Akiko Wakiyama (anabantoids), and doctoral student Akiko Morota (remoras), all from Tokyo University of Fisheries. Photograph by E.K. Balon.



Reiko Baba of Osaka City University studies brood parasitism and egg robbing in several freshwater fishes. Photograph by E.K. Balon, May 1994.



Left – Teodora Bagarinao (with son Carl Emilio) of the Southeast Asian Fisheries Development Center, Aquaculture Department at Iloilo, Philippines, who recently published (in EBF vol. 39, pp. 23–41, 1994) a wonderful review of the biology of the milkfish, and right – Annadel S. Cabanban of the International Center for Living Aquatic Resources Management in Manila, who just returned from a fellowship work on pomacentrid fishes at the Smithsonian Institution, Washington, D.C. and is working on a 'fishbase'-generated checklist of Philippine fishes.



Supap Monkolprasit, dean of the Faculty of Fisheries, Kasetsart University, Bangkok, an authority on Thai mangrove fishes, was recently the chairwoman of the highly successful Fourth Indo-Pacific Fish Conference.