EXPERIENCES AND VIEWPOINTS OF SELECTED WOMEN GEOMORPHOLOGISTS FROM THE MID-20TH CENTURY

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Abstract: In 1980, as a geomorphology graduate student, I wrote to five senior women geomorphologists in North America and Great Britain requesting information regarding their careers and career experiences. At that time, the number of professionally established women in geomorphology in those countries was very small. The sample consisted of three professors (Borowiecki, King, and Morisawa), one associate professor (Macpherson), and one research scholar (Mammerickx), who had received their doctoral degrees in geomorphology between 1949 and 1966. Each responded to the request for information with a letter and a curriculum vitae. The extent to which they discussed their views regarding, and their personal experiences as, women in geomorphology in the mid-20th century varied widely, as did the amount of biographical information that each provided. Nevertheless this archive reveals some commonalities in their backgrounds, experiences, and views about women in geomorphology. Three of the respondents reported experiencing discrimination early in their careers, while two made career adjustments because of family commitments. Overall the women generally credited their success as professional geomorphologists to a deep appreciation of nature or landscape and to considering themselves as geomorphologists who happened to be women. [Key words: geomorphology, women geomorphologists, history of geomorphology.]

INTRODUCTION

Numerous works have been published on the history of geomorphology, including notable books by Herries Davies (1969), Chorley et al. (1964, 1973), Tinkler (1985, 1989), and Beckinsale and Chorley (1991). Specific male geomorphologists, such as G. K. Gilbert and W. M. Davis, have been the subjects of full-length biographies (Chorley et al., 1973; Pyne, 1980), and numerous articles specifically address their work and influence (e.g., AAG, 1950; Judson, 1960; Baker and Pyne, 1978; Bishop, 1980; Yochelson, 1980; Sack, 1991, 1992). Likewise, many articles address the contributions of several other male geomorphologists, including J. H. Bretz (Baker, 1978), K. Bryan (Sharp, 1993), C. H. Crickmay (Twidale, 1993), and W. J. McGee (Harbor, 1989), to name a few, while R. A. Bagnold (1990), among others, penned an autobiography.

The work of some women geomorphologists has been noted in Anglo-American histories of the discipline. Tinkler (1985) mentioned Britain’s Marjorie Sweeting and Germany’s Hanna Bremer and cited publications authored or co-authored by them and other women, including Britain’s Cuchlaine A. M. King and Barbara Kennedy. On the other hand, very few articles and no books have a woman geomorphologist
as their primary focus. These articles consist mainly of such items as memorials of Marie Morisawa (1919–1994) (Coates, 1995) and Marjorie Sweeting (1920–1994) (Viles, 1996), and a short paper on Sweeting’s contributions to tropical and subtropical karst (Viles, 1997) in a supplement to the Zeitschrift für Geomorphologie published in her memory. Thus far, Barbara Zakrzewska Borowiecki is the only woman geomorphologist to have been interviewed on video as part of Dow’s (2004) 30-year Geographers on Film project. Despite their small numbers, or perhaps because of that, relating the circumstances under which selected 20th-century women geomorphologists pursued their professional interests seems appropriate.

As in most sciences, the number of professional women in geomorphology in the English-speaking world was small throughout the 20th century. Some growth in their number, however, did occur during that period. Women were virtually unrepresented in geomorphology early in the century. For example, the charter members of the Association of American Geographers (AAG), which was formed in 1904, were dominantly geomorphologists (James and Martin, 1978; Orme, 2004), but none of these was a woman. By mid-century, a few women with doctoral degrees in geomorphology, such as King and Sweeting in Britain, had become university faculty members. By the end of the century it was no longer such a rarity to find women geomorphologists in faculty or research positions in those countries.

In 1980, women role models for graduate students in geomorphology, as in geography in general, were still quite limited in number (AAG, 1979). In that year, inspired by a course in geographic thought, I decided to ask some established women geomorphologists in North America and Britain about their experiences in the discipline. Their thoughtful responses, which in most cases were quite detailed, depict some of their personal histories, motivations, and viewpoints. This paper summarizes the replies of these women to that request and analyzes their responses, primarily for trends and common themes. What these established scientists wrote 25 years ago about their personal and professional lives illustrates and reflects some of the principal elements of the social context of women geomorphologists in the mid-20th century, which for the purposes of this paper extends from approximately 1940 to 1980. Their accounts help geomorphologists today to understand better the history, and therefore the present state, of the discipline.

THE INQUIRY

The target sample for the letter of inquiry that was mailed in 1980 consisted of five women with doctoral degrees in geomorphology who were tenured professors or employed research scholars in geomorphology. Individuals were identified from my knowledge of women geomorphologists, which derived primarily from their role as authors of geomorphology books and articles, and from a search of the Guide to Graduate Departments of Geography in the United States and Canada for 1979 (AAG, 1979). I chose the five scientists who I knew with certainty met the selection criteria: Joyce Brown Macpherson, Jacqueline Mammereckx Winterer, Barbara Zakrzewska Borowiecki, Marie Morisawa, and Cuchlaine A. M. King.

I selected Joyce Brown Macpherson on the basis of the AAG (1979) Guide to Graduate Departments, which listed geomorphology as her principal research
specialty. I knew of Jacqueline Mammerickx Winterer from her work on pediments (Mammerickx, 1964) and because I had taken the geomorphology course that she had taught as a visiting professor at San Diego State University when I was an undergraduate student. Barbara Zakrzewska Borowiecki appeared as a geomorphologist in the AAG (1979) Guide, and I was familiar with her paper on landform geography (Zakrzewska, 1967). Marie Morisawa’s book (1968), Streams, Their Dynamics and Morphology, had been the assigned text for my undergraduate course in fluvial geomorphology. Likewise, I was already familiar with Cuchlaine King because of exposure to her books on coastal (1972) and on periglacial and glacial geomorphology (Embleton and King, 1968). The sample consisted of three professors, one associate professor (Macpherson), and one research scholar (Mammerickx). Four of the women were geographers and one, Morisawa, was a geologist.

The letter that I sent to each of the five women explained that I was a master’s student of geomorphology in the Department of Geography at the University of Utah. It described my purpose in writing to them as not to find out why there were so few women in the field, but rather as an attempt to develop a role model that might contribute to my professional growth since I had had little contact with women geomorphologists. Instead of presenting them with a list of specific questions to answer or topics to comment on, my request was open-ended. I asked them to send me information on their professional contributions, including a curriculum vitae with a list of their publications. In addition, I stated that “any comments you would care to offer concerning the evolution of your career, your motivation, or the role of women in geomorphology would be greatly appreciated.”

THE WOMEN AND THEIR RESPONSES

All five geomorphologists responded in a gracious and timely fashion to the inquiry. The variability in the length and style of response and in the topics that each addressed, however, made it difficult to organize the material into a coherent paper in 1980, although it was of great personal value to me. The task has become more manageable with the passage of time, and a quarter of a century later, the responses have taken on additional significance. The added dimension of time has helped to transform the material into a valuable source of historical information about the individual scientists, the discipline of geomorphology, and the social context of the field. This section presents the biographical material supplied by each scientist, followed where available by a summary of any comments that they volunteered in response to my open-ended query (cited earlier). Unless otherwise noted, the material is drawn from each person’s unpublished written communication to me in 1980.

Joyce Brown Macpherson

Born in 1929 in London, England, Joyce Brown [Macpherson] (Fig. 1) received her B.Sc. in geography at Bedford College in the University of London in 1950. After earning a postgraduate certificate in education there in 1951, with which she taught
high school, she returned to geography, receiving an M.Sc. from King's College at the University of London in 1956. For her master's degree under the supervision of S. W. Wooldridge, she studied valley patterns and their relation to the subglacial surface in east Hertfordshire. Macpherson moved to Canada where she studied the postglacial evolution of drainage for a Ph.D. in geography at McGill University in Montreal. She received her Ph.D. in 1966, when she accepted a faculty position, at first part time, in the Department of Geography at Memorial University in St. John's, Newfoundland. In 1980, Macpherson was a full-time associate professor with publications in glacial, drainage evolution, and regional geomorphology and the geomorphic applications of palynology.

Regarding her background, Macpherson (pers. comm., 1980) commented on the positive influence of having attended an all-female high school and undergraduate college—"hence I spent a large part of my early life in the company of women who regarded it as normal for women to be able to accomplish what they set out to do, whatever it might be." She knew of only one instance of prejudice that had affected her professionally. It occurred early in her career and resulted in her move to Canada, which turned out to be advantageous. She recommended a serious attitude toward one's work as the best response to personal prejudice. Macpherson also noted the stress of balancing family and career, and the physical challenge of field work, which was an individual matter. Married since she was a doctoral student, she had purposefully shifted toward palynological applications as a young professor.
with two children because it had the advantage of more laboratory and less field time. She felt that marriage and a family impacted a woman’s career by reducing scholarly productivity, thus potentially affecting promotion, and restricting freedom to relocate.

Jacqueline Mammerickx Winterer

Jacqueline Mammerickx [Winterer] (Fig. 2) was born in the mid-1930s in what was then the Belgian Congo, where her father worked for the railroad company operated by the colonial administration. One of his assignments during World War II was to survey the Congo and Zambezi watersheds for a rail line so that copper and other minerals could be taken to the coast for transport to Europe and America in support of the war effort. As a child, Mammerickx saw derailments, dams under construction, waterfalls, rift valleys, and wild-animal refuges. She became very aware of the awesomeness of the landscape around her and of its political and economic importance. In 1952 she traveled to Belgium to attend the University of Louvain (Leuven), where she studied geography and geomorphology. After graduation, she obtained a certificate from the same university to teach high school science, then worked in Brussels for a government geological survey preparing a map of the copper mining region of the Belgian Congo, with the aid of aerial
photographs. A geologist at the survey encouraged her to undertake doctoral studies of that region. She completed her Ph.D. work on African pediments and received her degree from the University of Louvain in 1960. When marriage brought her to southern California in 1964, Mammerickx obtained a position with Scripps Institution of Oceanography at the University of California, San Diego, as a research geomorphologist studying submarine landforms. By 1980 her publications consisted mostly of papers and maps related to her oceanographic research.

Barbara Zakrzewska Borowiecki

Barbara Zakrzewska [Borowiecki] (Fig. 3) was born in Warsaw, Poland, in 1924, and lived there until 1947. During grade school she already showed a keen interest in geography, maps, nature, and natural processes (Dow, 1986). With many schools closed during World War II, Borowiecki attended a secret high school (Dow, 1986) and became active in the Polish underground (Milwaukee Journal, 1966). After the war she undertook the study of civil engineering at Warsaw Polytechnic. Despite the encouragement of her father, who was an engineer, she was dissuaded from completing her studies because she was a woman (Dow, 1986). In 1947, with her war injuries requiring medical attention that was not readily available in Poland,
she moved to the United States (Milwaukee Journal, 1966). Free to pursue her academic interests, Borowiecki completed her undergraduate degree in geography in 1956 and a geomorphology master's thesis in 1957, both at Indiana University. She received her Ph.D. in geography from the University of Wisconsin in 1962, having written a dissertation on the upper Republican River basin of North America's central Great Plains. Borowiecki started teaching in the geography department at the University of Wisconsin–Milwaukee (UWM) two years before she completed her dissertation because she was anxious to earn money to help her parents in Poland (Dow, 1986). Borowiecki achieved the rank of associate professor in 1966 and professor in 1969. With her career well established, she married and thereby acquired a stepchild in 1971. When I contacted her in 1980 she had just completed four years as department chair, among the first women to serve in that capacity in a Ph.D.-granting geography department in the United States. Her publication record reflected her continued interest in eastern Europe as well as her interest in landform geography and geomorphic problems in the American Midwest.

Borowiecki considered obtaining a faculty position to be her greatest career challenge (Dow, 1986). In 1960 there were few women with doctoral degrees in geography and, as she was told by more than one department, little tradition for hiring women faculty members, perhaps particularly in her specialization. Although her early salary was less than that for male colleagues in similar positions (Dow, 1986), her professional accomplishments were obviously appreciated at UWM, where she quickly rose through the ranks. She emphasized to me that she had always been interested in physical geography and she conveyed her avid enthusiasm for field work and field studies. She succinctly expressed her view that “women have as much to contribute to geomorphology as men do” (Borowiecki, pers. comm., 1980).

Marie Morisawa

In 1980, being asked to relate her personal history was by no means new to Marie Morisawa (Fig. 4). Along with her letter and curriculum vitae, Morisawa enclosed a five-page transcript of a role-model paper that she had presented orally in 1976 at a symposium for women in the geosciences at St. Lawrence University in Canton, New York. Information presented here is derived from that enclosure as well as from her letter and curriculum vitae.

Morisawa grew up in a Japanese-American family with parents who valued education, closeness to nature, and the importance of pursuing one's own interests, whatever they were. Morisawa took some geology courses late in her undergraduate education at Hunter College in New York City, earning her B.A. in mathematics in 1941, with a minor in chemistry. She then entered the Union Theological Seminary and obtained an M.A. in religious education. After working as a religious teacher for two years in Hawaii, she accepted a position as laboratory technician in the Department of Geology and Geography at Hunter College. That experience convinced her to return to graduate school to study geology. Morisawa applied to several geology master's programs, but only the University of Wyoming accepted her. Although she was the lone woman among 40 graduate students, she felt
accepted as “one of the guys” and graduated in 1952. Soon afterward, Morisawa began doctoral studies at Bryn Mawr College. During her first fall at Bryn Mawr, however, she met Arthur Strahler of Columbia University at a Geological Society of America (GSA) meeting. With her interests now focused on geomorphology, she accepted his offer of a research fellowship. Morisawa received her Ph.D. at Columbia in 1960, at age 40, with a dissertation on stream flow in small watersheds.

The pattern of moving from place to place continued into Morisawa’s early professional career, perhaps made easier by the fact that she never married (Donald Coates, professor emeritus, Binghamton University, pers. comm., 2004). After finishing the course work for her Ph.D. in 1955, Morisawa worked as a laboratory instructor at Bryn Mawr for four years. With her dissertation nearing completion, she landed an assistant professor position at the University of Montana in 1959. Two years later she moved on to the U.S. Geological Survey. By 1963 Morisawa was back in academia, teaching at Antioch College in Ohio. She stayed there for six years, when she accepted a faculty position in the Department of Geological Sciences and Environmental Studies at the State University of New York at Binghamton, where she spent the rest of her career. Promotion to the rank of professor came in 1974. Although her greatest geomorphic interest was streams, by 1980 her

![Marie Morisawa, ca. 1990 (Knuepfer, 1994; used with permission of Elsevier).](image-url)
funded research had also included work on tectonics, mass movement, and shorelines. She was at that time first vice-chair of the Quaternary Geology and Geomorphology Division of the GSA, preparing to be chair—the first woman to hold that office—in 1980–1981 (Vitek, 1989). She was the driving force, along with Donald Coates, in establishing the prestigious Binghamton Geomorphology Symposia series in 1970 (Vitek, 1989).

Morisawa recounted several discouraging experiences in her career resulting from sexual discrimination. She described her rejection from all but one master's program because of the others having a policy of not accepting women. Oil company recruiters in 1952 offered to hire her as a secretary, but not as a geologist. In 1953, the director of a state geological survey explained that women were not allowed to go out on in the field alone. A brochure that Morisawa received advertising a summer field course for geology teachers expressly stated “no women.” At least one department chair in the early 1960s told her that an open faculty position would not be filled by a woman. Despite these negative experiences, Morisawa (1976, p. 5) remained optimistic, asserting that “if we consider ourselves geologists first and ‘ladies’ second, I believe that is how we will be accepted.” The sexual discrimination, moreover, did not particularly bother Morisawa because she had encountered far greater discrimination as a Japanese-American.

Cuchlaine A. M. King

Born in 1922 in Cambridge, England, Cuchlaine A. M. King (Fig. 5) was the daughter of W. B. R. King, later the eminent geology professor at the University of Cambridge. Her interest in geomorphology first developed through exposure to her father’s work. King studied geography at Cambridge, receiving her B.A. in 1943. From 1943 to 1946 she served in the Women’s Royal Naval Service (WRNS). Upon completion of her military service King returned to Cambridge to pursue graduate studies. She had become interested in coastal geomorphology as a result of beach studies conducted by her adviser and other researchers during the war in preparation for the D-Day landings (see, for example, Williams, 1947; King and Williams, 1949). King completed her M.A. in 1946 and her doctoral dissertation, on the movement of sand on beaches, in 1949. Her graduate-student experience included field research with her supervisor on beaches in the Mediterranean. King is also well known for her contributions to glacial geomorphology. Her interests in that topic were first stimulated by lectures from Frank Debenham, Professor of Geography at the University of Cambridge, who had traveled to the Antarctic with the Scott Expedition of 1910–1912, and by Vaughan Lewis, also at Cambridge.

King held a position as demonstrator in the Department of Geography at Durham University for a year before joining the faculty in geography at University College, Nottingham, in 1951 (now the University of Nottingham). Once at Nottingham, participation on a research expedition to Iceland in 1953 enhanced her interest in glacial geomorphology. She returned to conduct field research in Iceland in 1954, worked several field seasons in Norway, and eventually visited the Arctic. King became a professor of physical geography at Nottingham in 1969. By 1980 she had...
authored, co-authored, or edited several books on coastal, glacial, periglacial, and quantitative geomorphology, and numerous papers in a wide variety of highly respected journals.

According to King (pers. comm., 1980) "I personally never felt it a disadvantage to be a woman in my professional career, and I have I think been accepted on equal terms with my male colleagues." Indeed, that she and her work were well respected and held in the highest regard is evidenced by the pioneering role that she played in opening to women scientists government-sponsored field expeditions in glacial environments of the high northern latitudes (Fig. 6). In fact, she considered that the field-work barrier was no longer an issue for women, even in harsh environments. She discussed the importance of publishing to a successful academic career, noting that the ability to manage large research projects and the motivation to communicate the results to others through publication is principally a matter of individual temperament that is independent of whether one is male or female. Although King did not marry, she felt that marriage and family commitments could be a disadvantage to a woman geomorphologist because of the time and energy that women may devote to those commitments. King (pers. comm., 1980) considered field work and "a real appreciation of the value and beauty of the landscape" as essential for a successful career in geomorphology.
Despite the unique aspects of each woman’s personal history and viewpoints, some commonalities and interesting themes can be discerned in their life experiences and perspectives. Except for the fact that none went straight through her education without interruption, no single trend is mentioned by all five of the women. This is probably an artifact of the open-ended nature of the invitation for them to comment on their experiences.

Four of the five women explicitly expressed an appreciation of nature or the landscape around them that they had had since childhood, and characterized their father or parents as an important source of encouragement in this respect. Macpherson, who did not discuss her youth extensively, instead credited the supportive atmosphere of the all-female high school and undergraduate college that she attended for providing her with the feeling that she could accomplish whatever she wanted to do. From the information that they related about their families, it is clear that at least four, and possibly all five, were children of professionals and/or came from backgrounds that placed great value on education.

World War II played a major role in the early lives of these women. Macpherson did not specifically mention the war in her correspondence for this project, but as a child living in England at the time, it could have contributed to her feeling that women can accomplish whatever they set out to do. After all, World War II was a time when women were asked to undertake, and successfully completed, tasks that had hitherto been reserved for men. Mammerickx, although younger than Macpherson and living in central Africa, noted in her letter the impact of the war effort on elements of the physical and cultural landscape around her. World War II had direct impacts on Borowiecki, King, and Morisawa, who were in their late youth and early adulthood at the time. Traits, such as patience, tenacity, hard work, and self-reliance, that were emphasized in overcoming adversity and accomplishing goals during the war would later prove helpful to them in building successful professional careers.
Living in wartime Warsaw, Borowiecki showed great strength, resolution, and courage not only to attend a secret high school so that she could finish her secondary education, but also to serve in the Polish underground. Her ability to overcome adversity and meet challenges likewise appears in her moving alone after the war to the United States so that she could receive medical care for her war injuries, which also delayed her university education.

Like Borowiecki in Poland, King in Great Britain served her country during World War II. As soon as King received her B.A. in 1943, she entered the WRNS and was assigned to meteorological duties. Although the war delayed her formal graduate education by a couple of years, she may not have become interested in coastal geomorphology had it not been for the coastal research conducted in Britain in preparation for the D-Day landings. One can infer that her experiences during the war, with every capable person doing his or her part for the war effort, contributed to her belief that it is an individual’s ability, motivation, and temperament that account for success and not whether one is male or female.

Morisawa commented on the great personal prejudice that she had encountered as a Japanese-American, and this was undoubtedly most severe during World War II. After graduating with a B.A. in 1941, Morisawa attended a theological seminary but was not explicit about when she began that study. Whether or not it was before the Japanese attack on Pearl Harbor, a theological seminary could have been a relatively accepting environment for her to spend part of the war years. Her subsequent two-year period of teaching religion in Hawaii might also have had the benefit of enabling her to keep a low public profile while contributing something positive to others. Whatever her motivations, the end result of the prejudice that she endured was her kindness toward others (Coates, 1995) and a strong sense of self-reliance and responsibility that she would continue to make good use of throughout her career.

Macpherson, Mammerickx, and Morisawa each obtained a teaching credential before the Ph.D., and Macpherson and Morisawa mentioned working as high school and religious teachers, respectively, before initiating their disciplinary master’s degree. Teaching was a traditional career choice for women at the time. These women, however, were so motivated to learn about their chosen discipline that they became determined to do so in the formal setting of a graduate degree program, knowing that they would face social as well as academic challenges. As a result, they sooner or later gave up their initial teaching careers.

Borowiecki and Morisawa, the women who both obtained their graduate degrees in the United States and sought employment there, experienced considerable direct gender bias, especially early in their careers. King, on the other hand, felt that gender bias had not been an issue in her career. England, however, was not totally immune from such things, as the prejudice noted by Macpherson, apparently gender-related, had happened there while she was a student. On the basis of her 1980 correspondence, Mammerickx was apparently unaffected by direct gender bias.

It is impossible to compare the five geomorphologists in terms of their professional success in 1980 because of the range in their ages, career stages, geomorphic subfields, and employment types. However, all became established and successful
scholars. Most geomorphologists today, however, would probably agree that Morisawa and King had very successful careers, and the most name recognition of the five throughout the earth sciences. Morisawa and King were also the only two in the survey who did not marry. The two women who married early in their careers, Macpherson and Mammerickx, adjusted their research specializations for the sake of their families. To reduce time away in the field, Macpherson shifted into palyological applications to geomorphology. To work near her home, Mammerickx moved from a focus on pediments to submarine geomorphology when she accepted the position at Scripps. Although Borowiecki married after her career was well established, having a family still required her to make some adjustments in her approach to work.

CONCLUSIONS

The women discussed in this paper all received doctoral degrees in geomorphology and worked as professional geomorphologists during the mid-20th century, when women in that profession were rare. To do so took not only intelligence, a deep appreciation of nature, landscape, and field work, and a drive to learn more, but also tenacity, determination, and a strong sense of self. Like others raised in their time, they experienced delays in their education and three of the women were more than 35 years old when they received their Ph.D. They pursued their love of nature, learning, and research in most cases despite discouragements, but with the encouragement of parents, colleagues, and university funding. Indeed, having professional opportunities closed to them because they were women must have seemed petty to Borowiecki and Morisawa in light of the hardships and prejudices, respectively, associated with World War II that they had already endured. Those with families made some career adjustments, but nevertheless continued building their successful careers.

Whether or not they had experienced overt discrimination for being female, none of these women dwelled on their gender. They instead emphasized that it is one’s inner self, an individual’s abilities and temperament regardless of whether one is male or female, that determines success or failure. They each expressed in some form the notion that “I prefer to regard myself as a geomorphologist who happens to be female, rather than as a ‘female geomorphologist’” (Macpherson, pers. comm., 1980). That their gender was irrelevant to them in being good geomorphologists and accomplishing their career goals supports Morisawa’s assertion that how women consider themselves influences how others think of, and treat, them.

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REFERENCES


