Memorial to Eleanora Bliss Knopf
1883–1974

JOHN RODGERS
Department of Geology and Geophysics, Yale University, New Haven, Connecticut 06520

Eleanora Frances Bliss was born on July 15, 1883, the daughter of Mary Anderson Bliss and General Tasker Howard Bliss (Chief of Staff of the U.S. Army during part of World War I and a principal representative of the United States in the Allied councils in the last year of the war and the treaty negotiations that followed). She was born at Rosemont, Pennsylvania, the Bliss family home, in the midst of the crystalline rocks she was later to study. In her earlier years, her father was stationed principally in Washington, D.C., but with the Spanish crisis and war, his duties made him peripatetic. Only occasionally during those years could his family be with him, but his daughter long remembered and liked to recall the two years they spent in Zamboanga in the southern Philippines, after her graduation from college.

She went to Bryn Mawr College in the class of 1904, and there she came under the influence of Florence Bascom, a remarkable woman and geologist, already working successfully in the difficult rocks of the Pennsylvania Piedmont. Eleanora Bliss was the youngest of three geology majors at Bryn Mawr who became well-known geologists and remained fast friends for their entire lives. The other two were Anna Isabel Jonas and Julia Anna Gardner. In later years, Pick and Hammer shows would portray them with parodies of the Gilbert and Sullivan ditty: "Three little girls from school are we. . . ." (they were all distinctly short of stature, Miss Bliss being the most petite), but all three held their own successfully by sheer brainpower and accomplishment. Each in her prime was acknowledged as an outstanding specialist in her own field. This was long before Women's Lib and the downfall of the superstition that "geology is a man's game."

Miss Gardner became a paleontologist, specializing in Tertiary molluscs, but Miss Jonas and Miss Bliss followed Miss Bascom into the study of petrology, beginning with the enigmatic rocks nearby. They prepared a joint dissertation on the Doe Run–Avondale region, just west of Bryn Mawr, for which Bryn Mawr College awarded them doctor's degrees in 1912, and they continued to collaborate on the geology farther west in Pennsylvania and southwest into Maryland for another decade. All three "girls" became members of the U.S. Geological Survey, Miss Bliss first (though at first only a geologic aide), and it was within the Survey that Miss Bliss and Miss Jonas found husbands, in each case a widower. Miss Bliss married Adolph Knopf in 1920 and at once moved with him to New Haven, Connecticut, where he had been appointed professor at Yale University. Moreover, she was a wonderful mother to his children (she had none of her own). Miss Jonas married George W. Stose in 1938, and she and Miss Gardner remained in Washington.

If the U.S. Geological Survey had sense enough to recognize and employ brilliant women, Yale in those years did not, and Eleanora Knopf was never permitted to hold

any kind of academic appointment there or to teach any formal courses—a great loss to Yale. Yet she was very kind and helpful to any geology students who sought her help, as many, including the present writer, can affirm, giving them private courses on her specialties, introducing them into geological problems and even field methods, and, like her husband, encouraging them to do the best that was in them and to settle for nothing less. I was her field assistant during two springs when she was experimenting—among the first to do so, I believe—with the use of stereoptically viewed airplane photographs in field mapping.

Although never officially recognized, she had her desk and working space in her husband's office and continued to be active in geology. Soon she shifted her field activities from the Pennsylvania-Maryland Piedmont to the Taconic region on the borders of New York and New England, where the geology was equally enigmatic. Like Marland Billings, who at about the same time was starting the work in New Hampshire that ultimately revolutionized New England geology, she began work in a stratigraphic sequence with at least a few fossils and laid a firm foundation for later developments that only burgeoned decades later. She soon became convinced that techniques other than simple field work or conventional petrology were needed to understand the complex geology. Like her father and her husband, she was an accomplished linguist, and she was able to recognize the seminal nature of the structural analysis then being developed by Bruno Sander and others in Austria long before most American geologists, who were too often deterred by the formidable translation barrier. During one of Professor Knopf's leaves, the Knopfs visited Sander in Innsbruck, and by discussion, and especially by practice, she mastered the new techniques and the ideas behind them. During the 1930s, she introduced these ideas to American geology in a series of articles and a culminating memoir, probably her best known and most influential work. The subject has exploded since then, and the once famous memoir is now mainly of historical interest, as no doubt she would have wished.

The new ideas were concerned with the relation between deformation (strain produced by stress) and the visible effects it produces in rocks, and thus it was only natural that Eleanora Knopf should have been one of the first to advocate and practice the petrologic study of rocks deformed in the laboratory, bringing to it her long experience in the field and with the microscope. Again her interest helped to spark a whole new field.

In 1951, Professor Knopf retired from Yale and returned to his beloved California, where he taught for some years at Stanford University, and again Mrs. Knopf shared an office with him and even did some informal teaching. Having more or less wound up her work in the Taconic region (although the final report did not appear until 1962), she became, in effect, his field and laboratory assistant in his continuing research on the Boulder bathylith (as Knopf, knowing the correct etymology, always spelled it). Later he suggested still another project, but this time she demurred, telling him (as she used to relate with glee) that she was "a one-bathylith woman." After his death in 1966, she devoted herself to completing as far as possible the unfinished parts of the Boulder bathylith work and to putting the materials in good order, until her own failing health put an end to her activities. She died in Menlo Park, California, on January 21, 1974.

I have already mentioned the unfailing kindness and inspiration that students and others found in Eleanora Knopf. She was also a great lady, poised and serene, a charming hostess, and a loyal friend. One never forgot her intellectual power—she was never unkind or inconsiderate, but she never tolerated slipshod work or reasoning, and her criticisms were often the more devastating for being calmly and politely expressed. One

who knew them together can never think of her without her husband, or vice versa. They were intellectual equals, but there was no trace of jealousy. They saw eye to eye and complemented each other perfectly. She was a fine geologist, as he was, and, as he was, she would have been a great teacher—in a somewhat more perfect world.

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