The First Women to Earn Lamont PhDs

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This year, which marks the 75th anniversary of the Lamont-Doherty Earth Observatory (formerly, Lamont Geological Observatory), provides an opportunity to reflect upon Lamont's history and the many changes that have occurred over the years. One striking difference between the Lamont of the 1950's and the Lamont of today is the dramatic increase in the number of women geoscientists working and studying at its campus in Palisades, New York. The percentage was very tiny in Lamont's first decade, but grew to 15-20% in the 1990s[1], to 40-50% today[2].

Here, we examine the question, *Who were the first women to earn Lamont PhDs*? We choose this question both because of its importance and because the data needed to answer it is public and readily available. It is important because most Lamont PhDs – including women PhDs - have gone on to become distinguished professional scientists who, in aggregate, have had tremendous impact on the evolution of geoscience all over the world. The data that we have drawn upon are the dissertations that Lamont PhD students have written, and which subsequently have been preserved by the Columbia University Library and indexed by services such as ProQuest[3].

The term "Lamont PhD" is a colloquial phrase that cannot be defined unequivocally. Lamont (which is organized as a Research Institute under the Columbia University statutes) has no PhD program, per se. Instead, graduate degrees are awarded by an academic department, and especially the Department of Earth and Environmental Sciences (DEES) (formerly, Department of Geology), which maintains an office on the Lamont campus. However, DEES has students affiliated with other research entities, and especially with the American Museum of Natural History (AMNH) and the Goddard Institute of Space Science (GISS) (both in Manhattan). Furthermore, before the founding of Lamont, and continuing into the 1970's, DEES had a cadre of senior professors who were based on the Morningside Campus and who had no research presence at Lamont. They included mineralogist Paul Kerr and geomorphologist Arthur Strahler, both of whom were very distinguished, stratigrapher Marshall Kay, climatologist Rhodes Fairbridge and economic geologist Peter Ypma. John Sanders, a sedimentologist affiliated with Barnard College, also had only a minimal research presence at Lamont.

Our working definition of a Lamont PhD is a degree awarded to a DEES student who had a significant research presence at Lamont through having been advised by a Lamont-based scientist. Journal articles derived from the thesis and bearing a Lamont Contribution Number[4], which up until the 1990's, was required of all papers published by Lamonters, are further evidence that that the student was well-integrated into the Lamont research enterprise. Admittedly, this definition is *ad hoc*.

The ProQuest database does not identify the gender of the author of a dissertation. Our process was to start with the list of DEES PhD theses for the time period 1949 (the founding of Lamont) through 1984 (when women PhDs became fairly common) and eliminate all those with clearly-male given names. We used our own judgment for European names such as John and Mary, but consulted web sources for others, such as Naresh and Kashvi. A significant number of names, such as Dana, were gender-neutral, but in all cases, we were able to identify gender either by reading the acknowledgments section of the dissertation (where a husband or wife is often mentioned) or through web searches (which often turned up news articles that included photographs or used gendered pronouns). We then eliminated women PhDs associated with AMNH or advised by Morningside-based faculty. We also verified that none of the

women who we eliminated appeared in the Lamont Contribution List (for work leading up to and including their theses[5]).

By these criteria, the first ten Lamont Women PhDs are:

1. OVERSBY, VIRGINIA MCCONN, 1969, geochemistry, advisor Paul Gast, Contribution 1231, went on to Australia National University;

2. DONAHUE, JESSIE GILCHRIST, 1970, biostratigraphy, advisor James Hays, Contribution 959, subsequent employment unknown;

3. HERRON, ELLEN MARY, 1974, marine geophysics, Contribution 1115, advisor James Heirtzler, went on to the Lamont scientific staff;

4. RICHARDSON, DARLENE S, 1974, marine sediments, Contribution 2247, advisor Wallace Broecker and Dragan Ninkovich, went on to Indiana University of Pennsylvania;

5. WINSLOW, MARGARET ANNE, 1980, structural geology, Contribution 3039, advisor Ian Dalziel, went on to City College of New York;

6. NEVILLE, COLLEEN ANN (Ostrowski), 1981, paleomagnetism, 1981, LDE0, Contribution 2478, advisor Neil Opdyke, went on to the US Department of Energy;

7. ABBOTT, DALLAS HELEN, 1982, marine geophysics, advisor Roger Anderson, Contribution 3069, went on to Oregon State University (1982-1986), then to the Lamont scientific staff;

8. TAUXE, LISA, 1983, paleomagnetism, advisor Neil Opdyke, Contribution 2917, went on to Scripps Inst. of Oceanography;

9. WILSON, TERRY JEAN, 1983, structural geology, advisor Ian Dalziel, Contribution 4343, went on to Ohio State University; and

10. STEIN, CAROL ANN, 1984, marine geophysics, advisor Roger Anderson, Contribution 3747, went on to U. Illinois Chicago.

Two other women do not quite fit our definition of Lamont PhDs, because the students were advised by Morningside-based professor Paul Kerr and wrote theses on ore mineralogy (Kerr's specialty). Nevertheless, they went on to careers that connected with geoscience at Columbia:

JACOBS, MARIAN BECKMANN, 1963, ore mineralogy, advisor Paul Kerr, Contribution 812, went on to the Lamont scientific staff; and

GORNITZ, VIVIEN MONISA, 1969, ore mineralogy, advisor Paul Kerr, Contribution 1583, went on to the GISS scientific staff.

During the first two decades after its founding in 1949, there were no women Lamont PhDs. In this same time period, DEES graduated about ten non-Lamont women, about evenly split between paleontologists associated with the American Museum of Natural History and mineralogists advised by Morningside-based professor Paul Kerr.

In the years between Oversby (1969) and Stein (1984), the number of women Lamont PhDs averaged less than one per year, with gaps of up to six years. Some of these women may have been unaware of the significant impact of the thesis research of their predecessors. One of us (Abbott, 1982), remembers that

Winslow (1980) and Neville (1981) were both in the midst of their thesis research when Abbott arrived at Lamont in 1975, but that Abbott knew little, if anything, of the already-completed work of Herron and Richardson (both 1974), even though Herron was on the Lamont scientific staff. Ironically, as graduate students, two of us (Abbott and Menke, both 1982) took a geochemistry course that used *Chemical Equilibria in the Earth*[6], a textbook coauthored by Oversby (1969), without realizing that Oversby was a Lamont Ph.D. Opportunities were limited for women graduate students to be inspired by the successes of their predecessors.

Three pairs of these early women had the same advisors (Anderson, Dalziel and Opdyke), with the members of each pair graduating within a few years of each other, so that their tenures overlapped. Given the large number of potential advisors at Lamont, we believe that this pattern cannot be a statistical anomaly. Perhaps these advisors were especially willing to accept women students, or the less senior woman was especially drawn to the advisor by the presence (and good experience) of the more senior one.

We cannot say anything definitive about the Lamont-based women graduate students who left the program before completing the PhD, because a complete count cannot be made without accessing confidential University records. Nevertheless, such students appear to have been common. One of us (Abbott, 1982) recalls that three other women were admitted along with her in 1975, but left the program before graduating. One of these women transferred to another university for family reasons very soon after arriving, and two decided mid-program to pursue alternate careers in the performing arts. Also, around the same time, a somewhat more senior woman defended her thesis but, for reasons unknown to us, was not awarded the PhD. These losses worked against morale. We are not certain whether the high attrition rate during the late 1970's was a statistical anomaly or was characteristic of the early Lamont era as a whole.

The percentage of Lamont women PhDs rose sharply to about 20% in the mid-to-late late 1980's, and has continued to climb, reaching about 50% in 2015-2019.

Notes

[1]Bell, R., Laird, J. Pfirman, S., Mutter, J. Balstad, R. and Cane, M., 2005, An Experiment in Institutional Transformation, Oceanography 18, 27-34.

[2]Historically, the percentage of women Lamont scientists has varied considerably between the different academic units that comprise Lamont and between ranks[1] within those units. Furthermore, the political structure of Lamont has evolved considerably since its founding in 1949, with several new units having been formed. Although authoritative comparisons between early and present-day Lamont are difficult to make, the increasing trend is readily apparent. For example, DEES's full time, Lamont-based faculty is now about 40% women, up from 0% in 1949.

[3]ProQuest Dissertations & Theses Database, https://clio.columbia.edu/databases/2554991

[4]Publication List of Lamont-Doherty Earth Observatory (1949-Jan. 2001), https://www.ldeo.columbia.edu/~richards/my_papers/LDEO_contribs_to_Jan2001.pdf

[5]Some authors do appear in the Lamont Contribution List later in their careers, but while this is evidence of their continued scientific excellence, it does not imply that they were Lamont-based students.

[6]Broecker, W.S., and Oversby, V.M. (1971), Chemical Equilibria in the Earth, McGraw Hill Inc. (New York, USA), 318pp.