

Women Geoscientists – Why Not?

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Summary

Two years ago the Geological Association of Canada, realizing that women geologists formed a very small part of its membership, established a special committee to investigate the status of women geoscientists in Canada.

Since then the committee has made an attempt to find out how many women geoscientists and potential women geoscientists there are in Canada, and has compiled a register containing over 500 names.

Through a questionnaire survey it has sought the views of women geologists, graduates and students. It has contacted university departments, federal and provincial governments and a random sampling of industry for the employers' viewpoint. Some of the highlights of the results of these studies are revealed here.

Introduction

In an address to the annual meeting of the Geological Association of Canada in Saskatoon in May, 1973, retiring president E. R. Ward Neale drew attention to the fact that out of a membership of 2,000 there were only three dozen female scientists in the Association's ranks. "It's incredible in this era of liberal attitudes," he said, "that there are still so many primitive sexual hang ups in our profession." The GAC, he suggested, should put a study of the situation high on its priority list.

It did just that.

The Association's Council, by then under the guidance of W. W. Hutchison, president, approved the establishment of a special committee to investigate and report on the status of women geoscientists in Canada. Admittedly sympathetic to this cause, I found myself in charge of this committee.

Over the next few months its members were selected to provide a mix of male and female, from industry, government and university, across Canada.

They were:

H. Frederick Aston, Cominco, Toronto;
 Diane J. Gregory, Nova Scotia Department of Mines, Halifax;
 Esther R. Magathan, Union Oil Co. of Canada, Calgary;

Barbara M. Mioduszewska, Cominco, Vancouver;

Judith B. Moody, then Department of Geological Sciences, McGill University, Montreal, presently Department of Geology, University of North Carolina, Chapel Hill, N.C.;

E. R. Ward Neale, Department of Geology, Memorial University of Newfoundland, St. John's.

On Dr. Moody's transfer to the University of North Carolina her place at McGill was taken by: Elizabeth (nee Peat) Breakey, Department of Geological Sciences, McGill University, Montreal.

Dr. Moody remains on the committee as our link with the Women Geoscientists Committee of the American Geological Institute of which she is also a member.

Dr. Magathan resigned from the committee in late 1974 on moving to the United States.

Projects Undertaken

The committee set about analyzing its objectives and determining the best ways to come up with some facts about the status of women geoscientists in Canada. For example, how many qualified women geologists are there in Canada? How many women are currently studying the geological sciences at Canadian universities?

A register was initiated that now contains the names of over 500 women who are studying or have graduated in the geosciences in Canada and/or who are or have been employed in geoscientific positions.

This compilation was made by contacting universities and asking for details of female students and past

graduates in the geological sciences; by contacting government departments and industry and asking if they had or presently employed women geoscientists; and through personal knowledge.

How many of these graduates are employed to their satisfaction? Have any abandoned geology for other pursuits, and if so why? Are female undergraduates happy with the vacation employment offered to them?

A questionnaire was drawn up and made available to as many female geologists as time and circumstances allowed. It asked for details of education, employment experience, interests and employment expectations, date of birth and marital status. Further comment was encouraged.

One hundred and twenty-two questionnaires were returned.

What do employers and potential employers think of women geoscientists?

The Geological Survey of Canada, provincial mines departments and a somewhat random sampling of 26 major companies in the minerals industry were asked for their views on employing women geologists, and for their views on employing such women in the field.

A start was also made to investigating the matter of women visiting and working underground, by enquiries about Canada's various Mining Acts.

The Outcome

The first draft of a report on the results of these studies, which it is hoped, with various recommendations, will be made public in the near future, was presented to GAC's Council during this year's annual meeting at the University of Waterloo.

For the moment I should like to highlight some of the findings of the committee's different projects which have struck me as particularly interesting or significant.

Some Basic Facts

The studies have brought forth a flood of facts and comments, the latter probably covering every opinion ever aired on the subject of women geoscientists.

At April 30, 1975, our register contained the names of 537 women studying or graduated, and/or working or at one time employed in the geological sciences in Canada. In general any information on these

women referred to their status in 1974.

According to Statistics Canada, in 1961, 54 females were employed in geology or geological sciences, compared to 2,716 males; in 1971, 140 females compared to 4,550 males.

Of the 537 females on our register, 135 (25%) were known to be employed in geology or geological sciences in 1974 (see Fig. 1).

One hundred and seventy-four (32%) were students, of whom 119 were studying for a B.Sc. or the equivalent (some of whom probably graduated in 1974); 42 were studying for a master's degree (assuming those known to be graduate students but for whom further detail was lacking were working towards this degree); and 13 were working towards a Ph.D.

Twenty-one (4%) were out of the work force by choice, devoting their time to home and family.

A few were known to be in non-geological jobs or unemployed and seeking work.

The status of 200 (37%) was unknown.

This latter figure includes at least 33 B.Sc. and five M.Sc. candidates who probably graduated in 1974 but whose intentions as regards their future were unknown. It also probably includes some who are still students. Even so there seems to be an unusually large number of women geoscientists, primarily graduates from Canadian universities since they were our major source for the names on the register, of whom track has been lost. (I do admit, however, that much of the information in our register is scant, and of a preliminary nature.)

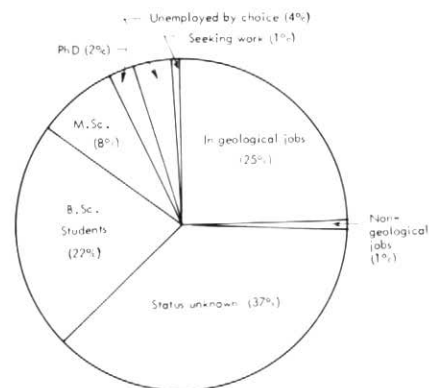


Figure 1
Status of 537 women geoscientists whose names are contained in register compiled by Geological Association of Canada's Status of Women Geoscientists Committee.

University Enrollment

Among the interesting points emerging from our studies, one most significant one is the definite upswing in the enrollment of women in geological science programs at universities across Canada.

Whereas in earlier years there might have been one or perhaps two women graduating in geology every now and then, since 1970 many universities have been graduating at least one woman in the geological sciences each year.

Queen's University for example had 10 women out of a total of 56 in its 1973-1974 graduating class. Memorial University graduated four women out of a class of 15 in geology in 1973. Carleton University had 19 women enrolled in its geology classes out of a total of 193 in the 1973-1974 session.

In our register, of the 249 women about whose first degree details were available, 45 (18%) graduated between 1950 and 1959; 77 (31%) graduated between 1960 and 1969; and 109 (44%) graduated between 1970 and 1974.

For the present status of these 249 B.Sc. (or B.A.) holders, the reader is referred to Figure 2.

While the number of women graduates has been increasing, so has the total number of graduates, however. Thus women graduates do remain very much in the minority, as Table I shows. This table also serves to illustrate how few women have gone in for higher degrees in geology. At least enrollment in master's and doctoral programs is increasing now but past performance

Table I
Comparison of number of female and total number of graduates in geology at Canadian universities, 1967-1974.

| Geology graduates | —Bachelor— | | | —Master's— | | | —Doctoral— | | |
|-------------------|------------|------|-----|------------|------|-----|------------|------|---|
| | Tot. | Fem. | % | Tot. | Fem. | % | Tot. | Fem. | % |
| 1967 | 167 | 5 | 3 | 75 | 1 | 1.3 | 29 | — | — |
| 1968 | 218 | 9 | 4.1 | 64 | 1 | 1.6 | 33 | — | — |
| 1969 | 234 | 13 | 5.6 | 93 | 3 | 3.2 | 33 | — | — |
| 1970 | 287 | 8 | 2.8 | 89 | 2 | 2.2 | 32 | — | — |
| 1971 | 384 | 14 | 3.6 | 117 | 5 | 4.3 | 34 | — | — |
| 1972 | 510 | 18 | 3.5 | 107 | 5 | 4.7 | 41 | — | — |
| 1973 | 540 | 24 | 4.4 | 111 | 7 | 6.3 | 49 | — | — |
| 1974 | 671 | 37 | 5.5 | 138 | 10 | 7.2 | 51 | 1 | 2 |

Total number taken from the Canadian Geoscience Council's "The geosciences in Canada 1974", with geology including geochemistry but not geophysics. Figure for 1974 is estimate. Number of females

records are poor - in fact abysmal at the doctoral level.

Of the 537 women on our register, 57 (11%) were known to hold an M.A. or M.Sc., at least nine of which had been obtained at foreign universities.

Seventeen were obtained between 1960 and 1969, and 31 between 1970 and 1974.

An additional 42 women were studying for a master's degree.

Only 20 women on the register were known to hold a Ph.D. or the equivalent.

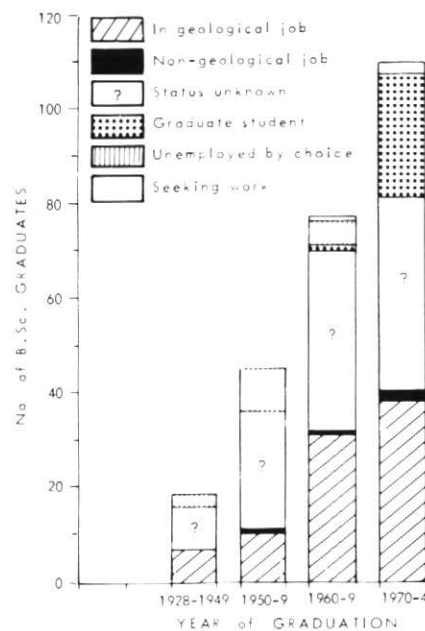


Figure 2
Status of 249 women B.Sc. (or B.A.) graduates whose year of graduation is known.

graduating each year derived from GAC Status of Women Geoscientists Committee register, and representing a minimum number.

For those who consider that higher education of women is a waste, it might be of interest to note that only one was unemployed by choice. The other 19 were all active in geological careers.

Of the 15 about whose degrees some details were available, it was known that 14 women obtained their doctorates at foreign universities. For the record, the one with the Canadian Ph.D. has since moved to the United States!

Of the 15 degrees, three were obtained between 1950 and 1959, three between 1960 and 1969 and seven between 1970 and 1974.

Thirteen of the students on the register were known to be working towards a doctorate.

Doubtless because few women hold a Ph.D. degree there are very few female members of staff in the geology departments of Canadian universities.

According to statistics gathered by the AGI Women Geoscientists Committee from AGI directories, in 1972 at degree-granting geoscience departments in Canadian universities there was one woman professor out of a total of 160; there were no women associate professors out of a total of 154; and there were three assistant professors out of a total of 84.

Questionnaire Survey

If the volume of comment was anything to go by, then women geoscientists and would-be geoscientists appeared grateful for the opportunity afforded them by the committee's questionnaire for letting off steam!

The survey attracted responses from 122 women. Statistical data were compiled from 120 replies, one having arrived too late to be included in the compilation and another regarded as ineligible.

Over half of the 120, actually 63 (52.5%) were following geological careers. Nine (7.5%) were in non-geological jobs. Eight (6.7%) were unemployed and looking for work (primarily but not exclusively recent graduates). Ten (8.3%) were unemployed by choice, with family commitments. (Altogether 56 of these women were married.)

The remaining 30 (25%) were students. Fifteen were studying for their first degree, 11 were studying for a master's degree, and four were studying for a Ph.D.

An analysis of the present status of those replying to the questionnaire and eligible for the work force is given in Figure 3.

Some women geoscientists appeared perfectly content with their lot in life. Many more were not.

It was acknowledged that in our particular line of business from time to time it can be difficult for anyone, male or

female, to obtain employment.

It was also acknowledged that the opportunities for women geologists have been improving over the last two or three years and are continuing to improve.

The majority of complaints centred on the trials and tribulations of obtaining employment that includes field work. This seems particularly unfortunate since time and time again these women mentioned that the prospect of working outside was one of the main reasons that they chose geology in the first place.

The problems start at the undergraduate level. If some of the stories told about the reasons given for turning women down for field jobs were not true, they would be hilarious!

For example, "Two companies have told me that they wouldn't want a female geologist in an 'all-male' camp . . . and then proceeded to offer me a job as a cook in the same camp," was one woman's experience.

"I was offered the excuses," said another, "that they couldn't hire females because then they would have to have two Johns, because women are not strong enough and used to working by themselves, and one gentleman actually told me that quite often women fool around and get pregnant."

Yet another pointed out that it is difficult to find a job in geology after first or second year of university.

"Then to get a job after third year you have to have had at least one year's field experience. It's a vicious circle."

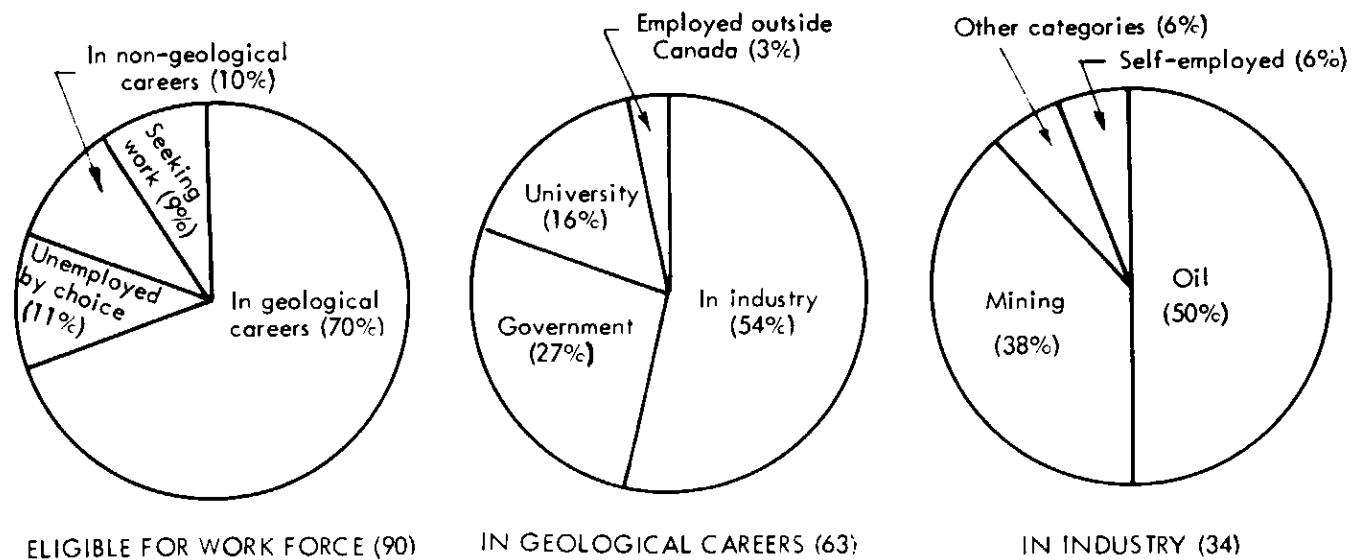


Figure 3
Status of women responding to questionnaire survey and eligible for work force.

I myself was particularly sympathetic over the remark, "I was offered the possibility of field work, but it never materialized," having had the same experience.

Yet even when field work has been obtained difficulties exist.

"When a woman has . . . by sheer dint of trying obtained a good background and over 10 years of field and mine experience, she can still experience difficulties in job finding because of prejudice."

Another reason given for not employing women geoscientists in the field is that male geologists' wives object. This aspect was mentioned by the officials of two companies as well as some of the women responding to our questionnaire.

High marks in class do not seem to help too much either.

One gold medalist reported that her male classmates were being offered their choice of 2-3 jobs on average the year they all graduated, while she received not one offer despite applying to all the major oil companies.

Women do seem to perform well in class too.

One company representative said: ". . . the women are always excellent students with very good records - the tradition of a man's field weeds out the ones weak in ability and determination."

Women Underground

At a time when amendments are being made to many of Canada's Mining Acts to permit women to work underground, because of the current labour shortage, it seems strange that qualified professionals might be refused access to underground mines on account of their sex.

Many graduate and undergraduate women geologists complained about this. Again it is something I have experienced myself.

Sometimes one is told it is because of superstition. Sometimes it is because there are no facilities for women. One time I was asked, "What if the hoist breaks down?"

At least this situation is changing. The 1972 24th International Geological Congress proved quite a turning point because of the insistence of the organizers that the field excursions be open to geologists and other professionals regardless of sex. Even so, one company held out, although an

alternative underground tour was available on the occasion in question. However, the committee has learned that this company has now changed its practice. Since the summer of 1974 visits underground have been permitted by both men and women in professional, semi-professional and student groups.

Government Attitude

As employers of women geoscientists, especially in terms of providing summer jobs in the field, the federal and provincial governments have in general set a very good example that industry is now beginning to follow.

Perhaps the best illustration of the approach being taken by a government department is found in the response made to our enquiries by the Ontario Ministry of Natural Resources, Division of Mines. One of my colleagues on the committee suggested it should be required reading for all.

Our experience since the first women were employed on field parties in 1970 has been essentially a non-experience in that there has been no change in the operation of the projects or in the problems encountered. We still have some students who are less capable than others physically and intellectually, both male and female. We have had no indication that capability in either category is appreciably different although admittedly our statistical base is not large.

There is very little in the way of policy difference viz a viz male and female field staff. About the only adjustment made is that we assign staff to mixed parties in pairs as a minimum, i.e., on a mixed crew of five, we would have a minimum of two women or two men. This procedure appears to eliminate any of the potential 'special' operational or accommodation procedures and costs.

Few new problems have been experienced over the last four years with mixed geological field parties and no general difference appears to exist in the capability of the staff. This does not mean that we blithely feel there never will be problems but these will probably be mainly in the area of human behaviour, in which we only have limited justification for interference. Depriving women geoscientists of work opportunity in order to avoid vague potential behavioural problems is not justified."

Industry Opinion

Twenty-six companies in the mineral industry were asked for their views on employing women geoscientists.

Replies were received from the following 23:

Aquitaine Co. of Canada
Ashland Oil Canada
BP Canada
Canadian Industrial Gas & Oil
Canadian Superior Oil
Cominco
Denison Mines
Falconbridge Nickel Mines
Gulf Minerals Canada
Gulf Oil Canada
Hudson Bay Mining and Smelting Co.
Hudson's Bay Oil and Gas Co.
Imperial Oil
The International Nickel Co. of Canada
Kennco Explorations (Western)
Newmont Mining Corp. of Canada
Pacific Petroleum
PanCanadian Petroleum
Placer Development
Rio Algom
Shell Canada
Soquem
Texaco Canada.

About half of these companies had female geoscientists on their permanent staff. At least seven had more than one such female and at least eight were known to employ female summer students.

To our question about the opportunities for women geoscientists being limited because of a lack of field experience came a range of replies.

Several oil companies noted that much less emphasis is being placed on field experience in the petroleum industry today, so a lack of it is not a deterrent to employment.

In the mining industry, however, that is not always the case.

One company representative remarked that the number of applications for both full time and temporary summer jobs from women had been increasing over the past few years. Applications from geologists with some experience were still virtually nil, however, and in that this company's requirements were mainly for geologists with some experience, the opportunities for women geologists with this company seemed to be restricted.

Another company commented: "Although the full utilization of a woman geologist depends on the individual herself, there are certain limitations on

field geological activities of women geologists."

The companies were asked about the complaint made by many women geologists that company representatives interview women "for appearances' sake" but rarely can offer employment.

As might have been expected, this charge was strongly denied.

"Ability is the first qualification" was one response.

One company did admit that this could be a problem in some areas but said that it tried to be as fair as possible.

"We are as concerned about being patronizing as we are about being fair in our judgement of qualifications."

In essence the comments made by the companies could be split into those from the "haves" and those from the "have-nots".

For example, it was a "have" company which stated: "We are using them in exactly the same way as other geologists. All are doing an excellent job and we would not hesitate to use women geologists in remote field areas in future years."

It was "have-nots" who said: "Our field operations do not provide an opportunity which is practicable for a female this year"; and "I have a bias against sending a single woman into an isolated area under primitive conditions."

In our letters to these companies we mentioned the register of women geoscientists we were compiling, and suggested, by way of encouraging a response, that it might supply the company concerned with a vice-president at some future date.

It was highly gratifying to note that two companies enquired why we stopped at the vice-presidency, suggesting that the presidency of a corporation is not an exclusive male preserve!

The Future

These studies that have been carried out by the GAC's Status of Women Geoscientists Committee indicate clearly that the continued existence of the committee is essential for the support and encouragement it can give to a minority group striving for equal opportunity.

It was with great pleasure that I handed over the leadership of the committee at the annual meeting in Waterloo last May to fellow-member,

Barbara Mioduszewska of Cominco, Vancouver. She has several plans for the committee in the year ahead.

The ultimate objective, of course, would be that the committee can disband, its existence no longer required. For all women geoscientists, that day cannot come soon enough.

Acknowledgements

Thanks are due to all who have given their time and support in the course of these studies by the Status of Women Geoscientists Committee of the Geological Association of Canada - to those responding to our letters and questions, to the Council of the Geological Association, and many more. I in particular appreciate the support of Northern Miner Press.

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THE CRETACEOUS SYSTEM IN THE WESTERN INTERIOR OF NORTH AMERICA-Selected Aspects

Edited by W.G.E. Caldwell
Geological Association of Canada Special Paper 13

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