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**Supervised Project Report  
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***A woman's place is - in Antarctica?  
History, experiences, and development***

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**Abstract/executive summary:**

Historically dominated by men, the Antarctic environment today is a place that includes women. Are women continuing to break ground and move increasingly unquestioned in Antarctica, or has the process been completed? Is it still necessary to apply the gender lens on human engagement in Antarctica today? This paper explores human engagement with Antarctica in terms of gender, drawing from the narrated experiences of three women who have had extensive exposure to life and work in Antarctica, and complements their perspectives with those of three men who have worked (independently from the interviewed women) on the ice. This is embedded in a summary of the history of women in Antarctica and a reflection on socio-political contexts.

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## 1. Introduction<sup>1</sup>

*“I don’t think that Antarctica is a man’s world. It is not a woman’s world either. (...) I think we all share its privilege and we all share its responsibility.”*

Dr Michele Raney, female physician in South Pole station 1978 (1994:47)

Antarctica is historically represented as male territory. The claiming, colonizing, and administrating of the Antarctic continent from the late 19<sup>th</sup> century onwards was performed by men, with women in subordinate and supportive roles only, if at all (Dodds 2009:505f). The first celebrated explorers were hardy, resourceful men. In contrast to Scott, Shackleton,

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<sup>1</sup> I would like to acknowledge and thank Dr Ursula Rack for her expert supervision of this project and Michelle Rogan-Finnemore for providing additional documents and information. Thank you to all of my interview participants who graciously provided insights into their experiences and perspectives on life and work on the ice.

Amundsen and the likes, there seems to be no Antarctica-related woman who has become a commonly recognised household name to date. Yet there are increasing numbers of women working, living, travelling and breaking records in the Antarctic today. The global community has come far from difficult beginnings in terms of women's participation in Antarctic science, exploration, and leisure. Antarctica, formerly perceived as "a testing ground of manly character" (Dodds 2009:505) is now increasingly also a testing ground of womanly character and a testament to mixed-gender interactions.

It remains, however, a place where men are represented over-proportionally – in factual numbers, and, arguably, in the general imagination. A quick look on the internet shows that even today, human engagement on the ice is not (yet) ungendered, nor is it unlinked with nationality. The concepts of gender, class, nationality and ethnicity ("race") are still heavily drawn upon and scrutinized in considering Antarctica today. Developments across nations vary in regards to gender – this may not come as a surprise when taking into account that there are over thirty different National Antarctic programmes (NAPs) operating in Antarctica. Culture appears to play a key role in gender issues.

Within an historically male hegemonic environment, are women continuing to break ground and move increasingly unquestioned in Antarctica, or has the process been completed? Is it still necessary to apply the gender lens on human engagement in Antarctica today? In trying to answer these questions, the project draws from the narrated experiences of three women who have had extensive exposure to life and work in Antarctica, and complements their perspectives with those of three men who have worked (independently from the interviewed women) on the ice.<sup>2</sup> This is embedded in a summary of the history of women in Antarctica and a reflection on socio-political contexts.

The narrow scope of this project both in number of participants interviewed and feasible depth of research is due to time constraints and course requirements.<sup>3</sup> While this means that findings are not necessarily representative or comprehensive enough to draw general conclusions, they are nevertheless able to give anecdotal glimpses into a few selected

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<sup>2</sup> In keeping with the Human Ethic Committee's regulations, the names of participants have been anonymised, and identifying information has been removed as far as possible.

<sup>3</sup> Once started, I received more names of potential research participants than I was able to follow through on. I had to make the decision to cap the numbers for interviews so as not to generate more data than I would be able to use in my paper. Due to the rich topic and many enthusiastic and helpful leads and comments, it is with regret that I had to limit my interactions.

perspectives. Larger research questions that presented themselves in the course of writing this paper are outlined at the end and will require a more time- and resource intensive approach.

## 2. History: Women's presence in Antarctica

### 2.1 Entering male territory

The NZ Scott Base gift shop in the Antarctic sells an iron-on patch that says “A woman's place is in Antarctica” (Figure 1), an ironic nod to mostly outdated gendered notions around work division and socio-cultural roles. Like many social developments in regards to gender equality, today's largely unquestioned presence of women in NAPs and on Antarctic bases is a development that occurred in the last half-century only.



*Figure 1 Iron-on patch seen in Scott Base gift shop, Antarctica (A. Herbert)*

In the early days of Antarctic exploration, colonization, and commercialization through tourism, women were not entirely absent from Antarctic undertakings, but were reduced to passive roles: as companions to male workers or explorers, or as namesakes for geographical features in the process of appropriating territory (Dodds 2009:506). Ernest Shackleton reportedly remarked that there were “no vacancies for the opposite sex on the [1914-17] Expedition” (Dodds 2012:42), and this stance was reflected in other Antarctic realms, both for

field parties and stations, over the next few decades (Table 1). One hundred and fourteen years passed between the first man reportedly setting foot in Antarctica (in the year 1821) and the first reported woman to do the same (1935). Between the first man (1899) and the first woman (1947) wintering intentionally, there are 48 years of difference<sup>4</sup>, while the span between the first man’s visit to the South Pole (1911) and the first women’s (1969) is 58 years.

**Table 1: Overview of selected gendered Antarctic experiences<sup>5</sup>**

Year	Activity	Name	Nationality
1821	First man to set foot in Antarctica	John Davis	US
1898	First men to winter over (involuntarily)	The <i>Belgica</i> expedition	Belgium
1899	First men to winter over (voluntarily)	Carsten Borchgrevink, <i>Southern Cross</i>	UK
1911	First men at the South Pole	Roald Amundsen	Norway
1935	First woman to set foot in Antarctica	Caroline Mikkelsen	Norway
1947	First woman to winter over (on privately organized expedition)	Edith “Jackie” Ronne, Jennie Darlington	US
1974	First woman to winter over as part of NAP	Mary McWhinnie, Sister Mary Cahoon	US
1969	First women at the South Pole	Lois Jones, Eileen McSaveney, Kay Lindsay, Terry Tickhill, Pam Young, Jean Pearson	US, NZ

The evolution of women from companions (e.g. as whalers’, explorers’, or scientists’ wives) to colleagues (as scientists or support workers) happened in the span of roughly a century. Data of early women’s visits to and engagement with the Antarctic are patchy at best, but show that the first women went to the Antarctic or the Sub-Antarctic from the early 19<sup>th</sup> century onwards (Chipman 1986:167ff). Some women had semi-officially ascribed roles during these trips, such as Edith Ronne, who via the newspaper articles she produced served as a chronicler of the expedition (and whose presence was thus justified by her husband) (Chipman 1986:76). In general, however, the women travelling to Antarctica were restricted to passive, observing, and accompanying positions. Exceptions to this are Russian women who from the late 1940s on worked aboard Russian Antarctic whaling vessels (Chipman 1986:66). In what Legler (2011) calls the “pre-feminist phase” of Antarctic engagement, women are prescribed, and accept, traditional roles in the newly entered male territory.

<sup>4</sup> If comparing winterings conducted as part of NAPs, the difference would be even greater: 75 years.

<sup>5</sup> Table compiled with data from Chipman 1986.

Trying to blend in, become inconspicuous (Darlington 1957:177) and be out of the way, women took on the roles of “male helpmate, civilizer, friend and confidant” (Legler 2011:210). By doing so, they appeared to accept the notion that women are the ‘weaker sex’, not mentally or physically fit for the Antarctic environment, and not able to contribute to the professional undertakings in a significant way. This mirrored a commonly disseminated stance in the wider society at the time, which justified limiting women’s engagement to specific roles and places “suitable for women”.

Change started to occur roughly from the 1960s onwards.<sup>6</sup> The first active engagement of women in Antarctica followed a general opening of minds during the IGY in 1957/58 and the subsequent release of the ban by the US Navy in the late 1960s that had until then prohibited women from going to the ice. Specific restrictions remained in place longer than that, however: In 1970, the US Navy still held fast to the rule that a woman could not go to Antarctica if unaccompanied by another women (Land 1981:81), with exceptions hard to obtain (Land 1981:102).

As stations were built, Antarctic mapping and scientific activities increased drastically, and a nation’s presence on the ice became a matter of geopolitical significance from the 1960s onwards, more women were gradually allowed to enter the continent for work. In a pioneering occurrence in 1955, Marie Klenova (Soviet Union) was the first woman employed as a scientist in her own discipline. Australia, the US, and then other NAPs followed suit in the decades after (Chipman 1986:81ff).

Today, there are significant numbers of women living and working in Antarctica – at times with certain seasonal restrictions. In a 2015 interview, Dr In-Young Ahn, the first female Korean station commander (King Sejong base), reported that during the summer season, the female-male ratio at the base is 1:3. In winter, this number drops significantly, with Ahn being the only female out of 16 winterers in 2015, and no women in Jang Bogo (Havermans 2015:11f).

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<sup>6</sup> This varied across states: whereas the US spearheaded the inclusion of women in their National Antarctic programme with the appointment of two women scientists in 1969 (Chipman 1986:111), Australia’s Antarctic division was male-only until 1979, and the ratio of women to men in 2005 was still 1:8 for Antarctic expeditions (Sarris & Kirby 2005:162). The BAS employed women to work offshore, but did not allow them to go to Antarctica until the late 1980s. The first woman wintered at a British station in 1992 (N. Gilbert, pers. communication).

## 2.2 Reasons and justifications for the exclusion of women

Several reasons were used in the 20<sup>th</sup> century to justify the exclusion or marginalization of women in Antarctic endeavours. They were found in the psycho-social and logistical realms: women were regarded and portrayed as unsuitable in character or physical disposition for the harsh Antarctic climate, unsuitable in mixed-gender environments (they were feared to be distractions or socially problematic), or logistically unmanageable in the bases: equipment was modelled on the male body<sup>7</sup>, and bathroom facilities<sup>8</sup> in Antarctic stations were determined as male-only (see Dodds 2005:507).

### *The weaker sex argument*

These reasons deserve a closer look. What was behind the argument that women, as the supposedly 'weaker' sex, were physically unsuitable for Antarctica? Dodds (2009:507) believes there was another dimension to this initial male resistance to women in the Antarctic. He argues that the increasing exploration and colonization of Antarctica in the 1940s-50s was a continuation of the male bonding and male self-definition experienced in World War II. Antarctica was perceived as an escape from post-war austerity and a space to enjoy on-going male companionship under trying conditions. For roughly two decades, men had exclusive access to a male "playground" in which they could operate without many rules or supervision, test themselves, and earn admiration and a public image as heroes and "real men" upon return. The presence of women, the "weaker" sex, in this pronouncedly male space threatened to unmake the idea that only the male body can endure and overcome Antarctica's harsh conditions (Legler 2011:210).

Upon a closer glance, the reality of life in Antarctic stations of course looks different. The male heroic (self-)image is easy to deconstruct when considering men as Antarctic amateurs especially in the early days of human engagement with Antarctica. Men were looking for an adventure and trying "to indulge their Peter Pan fantasies" (Legler 2011:213). With improving technology and increasingly modern stations, life and work in Antarctica has

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<sup>7</sup> To date, the US National Antarctic programme only produces clothing tailored to the male form, with women being issued smaller but not anatomically adjusted gear. New Zealand, by comparison, issues both male and female gear (P. Woodgate, pers. communication, 14 December 2016).

<sup>8</sup> Also see the South African Antarctic division which in 1994 still justified the lack of women wintering with insufficient bathroom and sleeping facilities (Tilbury 1995:97).

become more comfortable and less extreme than ever: this should finally, if nothing else, lay to rest the image of Antarctica as a workplace only men can handle.

### *The social disruption argument*

But it is not just the mundanity of repetitive station chores (both domestic and task-related) that challenges the image of the heroic male self (Dodds 2009, Legler 2011:215). A widely used justification for the exclusion of women from the bases and the field was, and arguably remains in some cases, the concern that women would disrupt, hinder, and overthrow social harmony in a male-only environment.<sup>9</sup> The US Navy banned women from entering Antarctica until the early 1970s also because of “the fear that the sanctity of the land itself would be spoiled by the ‘dirtiness’ of sexual relations” (Legler 2011:214) – this is another take on the “pristine” label Antarctica is persistently (and against contrary ecological evidence) ascribed.

Throughout the last century, women were considered a “problem” to the Antarctic community. This view has since shifted to the point where *relationships and interactions* between men and women are perceived as likely to create tensions. This differentiation moves away from a sole blame on women to a focus on inter-gendered realms. Antarctic relationships continue to be scrutinized but have gradually shifted from being perceived as predominantly problematic to mostly beneficial in regards to women.

## 3. Relationships and social disruption

### 3.1 Sexual tensions

Concerns about having women work in until then all-male teams included the anticipated reaction of men to a female presence (Figure 2), namely that “a woman would walk down the hall in black lingerie and start a riot”, as Michele Raney (1994:41), who was the first female physician to winter over at the South Pole station in 1979, succinctly put it.

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<sup>9</sup> Also note the words of Rear Admiral Dufek, commander of US Antarctic operations, who in 1957 stated that “[w]omen will not be allowed in the Antarctic until we can provide one woman for every man” (Chipman 1986:86).

## IN ADELIE LAND

Dumont d'Urville suffered further bad weather in November with heavy snow-fall. The average wind speed was 35 km./h. with gusts of more than 200 km./h. The sea ice, firm up till mid-November, steadily deteriorated, leaving the sea smooth up till the beginning of December.

In spite of these unpelasant atmospheric conditions the preparation of Marret Base was actively carried on. Two weasels were on the glacier and a quantity of material was sent on to Cap "Prudhomme".

The relief ship "Thala Dan" left Hobart on December 6 and arrived at Dumont d'Urville on December 11. On board were M. Rolland (Administrator-in-Chief of French Antarctic Territories), P. E. Victor (Director of Expeditions Polaires Francaises), Professor Pedoya, and Dr. C. Lorius, Leader of the new (15th) Expedition; also the majority of the members of the expedition, 21 comprising the summer party and 11 to winter over.

### SUMMER WORK

As soon as unloading ended, on December 14, the summer pro-

During the final two weeks of "Thala Dan's" stay the weather was excellent: "lovely sunshine and no wind".

"Thala Dan" returned to Tasmania on January 4, to allow three passengers to travel to Hobart by launch from Piersons Point, near the entrance of the Derwent River. The ship then went on to Melbourne.

### WOMEN = WORRIES

The veteran French Polar explorer, Dr. Paul-Emile Victor, sees it this way. He told reporters in Hobart in December that women would not be accepted for Antarctic work -- "The Russians and the Americans have tried it," he said, "but it did not work out.

"Women make excellent scientists, and they are physically fit to go to such places. However, in an Antarctic base emotional problems would occur between men and women, and this would not exactly help our scientific work.

"We already have enough worries and I see no reason why we should help to create new ones."

*Figure 2* A short article in *Antarctic* 4(1), 1965, labels Antarctic women as worries

The British Antarctic Survey (BAS) took longer than other western NAPs to allow women onto the ice (Table 2). A male scientist who was station commander for the first British base to allow women to winter over in 1992/93 mentioned that the change process happened quickly – once it happened. Behind the scenes, however, there was lots of discussion. Matters of concern included how the existing 'male dynamics' of the station could be changed – "very simple things like, how to get the very pornographic calendars taken down [in some areas of the base] where the mechanics work?" and whether the station should have separate or mixed facilities.

**Table 2:** First women working for NAPs on the ice, by country (selected)<sup>10</sup>

Year	NAP	Details
1955	Soviet Union	Maria Klenova, marine geologist
1959	Australia	Mary Gillham – first British woman to join Australian Antarctic research (together with 3 other women)
1963	Chile	Nelly Lafuente, Wanda Quilhot
1968	Argentina	Drs Irene Bernasconi, Mara Adela Caria
1962	USA	Mary McWhinnie, Phyllis Marciniak, biologists
1969	NZ	Pamela Young, field assistant to her biologist husband
1970	USA	First NSF funded woman scientist: Irene Peden
1974	USA	First chief scientist winter McMurdo: Mary Alice McWhinnie
1976	Australia	First woman to winter
1983	BAS	Janet Thomson
1991	USA	First USAP station manager: Ann Peoples
1992	BAS	First woman to winter at Signy Station
1996	BAS	First woman to winter at Halley Station
2015	Australia	Chief Scientist: Gwen Fenton

Barry Heywood from BAS (Heywood 1994:95) justifies the “cautious”, i.e. late introduction of women into the British Antarctic programme with a concern for everyone’s mental and physical wellbeing. He believes that based on experienced troubles described (i.e. sexual harassment), the BAS did not move too slowly but rather other programmes moved too fast. The station commander I interviewed for this paper stated that the BAS had experienced growing pressure from the Natural Environment Research Council (NERC), the science funding body for BAS, to include women on their NAPs on the ice. NERC felt it was time for change, and that the exclusion of women constituted an outdated policy. Female scientists who by that time were working at BAS but prohibited to go to the ice supported this notion, as did the director at the time.

How did the change at the BAS occur after this long build-up? One of my interview partners, a British male scientist, remembered that a lot of emphasis was put on internal communication. BAS did not want the first women on the station to be mulled over extensively by either the press or other team members, or receive a lot of (public) attention.

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<sup>10</sup> Table compiled using data from Chipman 1986, BAS 2015, and pers. communication with interview participants.

The goal was for the people involved to accept the change as the “new normal” as quickly as possible. The station commander stated that the topic was often raised in the frequent one-on-one conversations with base members that he conducted. While nobody objected to women entering the team, concerns were raised over whether or not it would work in regards to the team’s social dynamics. A main focus in this were emotional and sexual relationships that might establish, and how this could have a negative effect on the morale of the others: in a close-community setting, the unfairness of individuals having a normal relationship with someone while others were denied this, was feared to potentially cause significant disruption and disharmony.

### 3.2 Sidestepping the difficulties? Single-gender teams vs mixed-gender teams

With so much concern about the impact of women on previously male-only closely-knit teams, does the answer lie in the formation of single-gender teams? Sir Vivian Fuchs, director of the British Antarctic Survey from 1959 to 1973, argued against mixed-gender teams:

“Should it happen one day that women are included as part of the base complement, problems will certainly arise... this does not mean that women could not compete with the environment – they certainly could – but it might be wise for them too to form single-sex communities.” (Fuchs as cited in Aston 2005)

Single-gender teams as part of NAP expeditions might have looked promising on paper, but were less so when put to the test, as will be explored in the following section.

#### *Single-gender teams*

A female scientist who was a member of the first overwintering all-female team of a European NAP in 1989 opposed the idea of single-gender teams as “very unnatural” and driven by the wrong reasons. She had been asked by her NAP to undergo a pregnancy test at the end of the summer leading to the winter season, which she refused. Female Antarcticans becoming pregnant, she believed, was the biggest fear of the NAPs, as this might lead to bad press and subsequent damage to the programme’s reputation. So concerned was her NAP about this not happening that they contacted the captains of other ships going past the station in which the woman team was wintering to communicate a visitation ban: the women team therefore had no visitors throughout the winter, with the exception of a South African ship which had

to make a landing for technical issues, and a Norwegian ship that conducted a routine station inspection under the premises of the Antarctic Treaty agreement.

The women countered this isolation with strategies of their own: they developed a lively inter-base communication with neighbouring stations that became “rather addictive”: “Sometimes it was just nice to hear a man’s voice, just for a change.” Notably, it was not so much the gender that was important in these communications, but the sharing with someone who was in a similar situation and could relate to the ramifications of prolonged isolation, life and work in a small team, and exposure to a hostile environment.

Do single-gender teams fare better in regards to performance and sociability than mixed-gender teams? In terms of productivity and wellbeing, research seems to support both single-gender and mixed-gender work. Looking at social interactions in single-gender and mixed-gender polar expedition teams, Atlis et al. (2004:403) found that in mixed-gender teams, “women have often assumed or been placed in a more nurturing and less dominant role” than men, incorporating the role of peacemaker and reducing tension among the male group members (also see Puskeppeleit 1994:81). In contrast to all-male teams, in which high levels of competitiveness and hostility against the expedition partner were recorded, all-women teams displayed high confidence, high motivation and low levels of competitiveness. The biggest stressor for women was a concern for the other team members, whereas stressors in all-male teams were the environment and interpersonal conflict (Atlis 2004:404).

A key component of the more harmonic atmosphere in all-women teams was consultative decision-making. In an all-female team, no friction was recorded, unlike in mixed-gender and all-male teams (Atlis 2004:421). This was possibly thanks to better communication, as Puskeppeleit (1994:77ff) notes in regards to problem-solving strategies in an all-female team at an Antarctic base. For mixed-gender teams in Antarctic stations, Schmidt et al. (2005) summarize that while they can show slightly higher levels of performance, more conflict will arise if more than half of the group is female. These findings support perspectives that favour a normal gender ratio in Antarctic stations, i.e. a gender ratio that mirrors the common gender ratio of states.

The summary female scientist who was part of an all-women wintering team drew was that what matters in regards to team culture and group well-being was not gender but individual personality traits and overall group make-up. To have a forced gender quota, she believed, would be

“complete nonsense. It always depends on the individual person. You can have a great crew with [however many] men or women, it always depends on the personalities.”

The intentional formation of single-gender teams was a contentious topic for other Antarcticans I spoke with, too. A female American scientist, when asked whether she thought single-sex teams would help the avoidance of the oft-cited mixed-team tensions, remarked that

“the world isn’t like that. (...) It’s not representative of society; it is about picking the best people for the job. It may well be that it turns out to be all women, but it shouldn’t be the starting point.”

She felt that not only was the attempt to sidestep sexual tension futile (“There are sexual tensions in the whole world”, also see Williams 1994:84), it could also potentially jeopardize what she felt should be the top priority in selecting research teams: task ability regardless of gender or team composition. Separating capable scientists into single-gender teams would also send a message of distrust to employees. Hiring people assumes that they are capable of dealing with the intricacies of the Antarctic work environment:

“We need to give more credit to these people. If we start excluding every situation where increased tensions may arise, we’ll probably stop sending people to the Antarctic altogether.”

### *Mixed-gender teams*

The number one difficulty of mixed-gender teams mentioned in my interviews was emotional and sexual relationships between base members. A British male scientist noted that

“people were always looking at relationships, (...) that was probably the issue (...), looking at women in terms of who she is having a relationship with in Antarctica. (...) Who was the woman connected up with, or having an affair with, or having a relationship with, that was the perception, and [laughs] ninety-five percent of the time, that happened... allegedly”.

The ongoing speculation “influenced the dynamics of our field parties... negatively”, a view that Barry Heywood from the BAS concurs with in regards to station morale (1994:95f). My interview partner was also aware that while interpersonal dynamics were part of normal life, the enclosed environment would enhance the tensions, and in a team environment, jealousy and perceptions of preferential treatment have the potential for significant disruptions. Lynn Williams (ANARE) agrees that relationships may be the cause for

disharmony in a group setting especially for winter teams.<sup>11</sup> The more disruptive kinds of relationships in her opinion are those that are formed after leaving the sending country, those that involve team members who have spouses back home, and serial relationships within the group (1994:88). Overt, flaunted relationships were also perceived as less ideal by several of my research participants.

When speaking with the male British station commander who saw the first women winter at his base in 1992, he confirmed that the forming of relationships can have an unsettling effect on team members. He recounted how in the summer leading up to the first mixed-gender wintering party, the base carpenter became interested in one of the summering women:

“He became very keen on one of the women quite quickly; he made an effort to take her out. It was his second summer, and he was going to stay the winter. She formed a relationship with someone else, and he did not cope at all. On one occasion, he smashed up the carpenter’s workshop, throwing the tools around – a very physical venting – [this happened] on more than one occasion. He’d take himself off for some days, staying at one of the huts, which was allowed, to calm down. He really suffered.”<sup>12</sup>

In this instance, the station commander made the decision to remove the carpenter from the wintering staff, as he had become very separated from the rest of the team. The commander remembers this time as very challenging for all involved, but notes that this was an isolated incident.

How do NAPs respond to the issue of sexual tensions that can arise in mixed-gender teams? The BAS emphasises the need for appropriate instruction and training<sup>13</sup> that address

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<sup>11</sup> But note the words of Philip Law, Australian Antarctic division, who points out that all-male wintering teams suffer from a lack of mixed-gender relationships, too: “No single deprivation counts as greatly as that of women. However, the matter is much broader than the narrow question of the lack of sexual intercourse. I believe this is not nearly as important as many people might expect, whereas the lack of female companionship in the widest sense is felt very greatly” (1994:71).

<sup>12</sup> Also note that infatuation of course applies to all genders. A female support staff who worked at McMurdo station described working in Antarctica as “the best opportunity in the world” for women, but “just be careful who you mix with. Because you’re probably there for four months, so just sit and watch to start with. There will be types of people who will just be wanting to charm the pants off you – literally, and you know, a month later, they got the pants off you, and they don’t give a toss. And you still gotta be there with them for three more months. I’d just watch for the infatuation.”

<sup>13</sup> A British male scientist who witnessed the change-over from all-male to mixed-gender teams mentioned that he was not convinced of the quality of training in this regard: No invited experts from the outside were brought in, none of the BAS staff were social psychologists, and the issue was thus addressed from what he now believes was a very amateurish angle. He, however, also noted that he was not sure whether there was gender-specific training at all, but would have found it unnecessary in any case.

behaviours and reactions to social situations such as forming relationships<sup>14</sup> (Heywood 1994). In line with what one of my female interview participants noted, emphasis is put on responsible individual behaviour, i.e. self-discipline and self-regulation. According to Heywood (1994), BAS accepts that relationships happen and that more discreet relationships are less likely to cause disharmony. Michele Raney phrased her view on the situation as follows: “The station can survive despite the fact that someone is having sex and somebody is not” (1994:45), but to avoid the “almost inevitable ... serious trouble” that small numbers of women in a larger male group will cause (Law 1994:72), the solution is not to separate the genders, but to employ strategies to address the tensions. Besides discussion and peer-group problem solving, leadership was deemed to play a significant role in the smooth operation of mixed-gender teams. Williams (1994:91) attributes sexual harassment occurring on base to poor leadership. He believes that instead of treating sexual harassment as the primary problem, it should be considered the symptom: namely of both poor leadership quality and poor selection.

But amidst the discussion of potential or experienced problems, the change process from an all-male to a mixed team was not always judged to be challenging. As a female scientist noted, mixed-gender teams will alleviate some of the problems encountered in single-gender teams:

“Everyone tries to behave better, doesn’t curse so much, etc. For some things, that’s just easier. Of course you’ll have more emotional things, so it can get complicated [but] the men always want to look good in the eyes of the women and the other way around.”

Furthermore, she saw advantages in the collaboration between genders with differing communication and problem-solving styles. She recounted an example of how to deal with a team member who was having problems: In a male-only team she encountered, a man who had been isolating himself from the group was left alone, which enabled him to isolate himself further. In the all-women team she was part of, the team members “discuss everything. For hours, days, weeks if necessary”. She believed that a combination of these styles would make for an ideal work environment:

“Something in the middle would have been ideal, and that’s what happens in the mixed group. So, for me, that’s just the most natural way to do things.”

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<sup>14</sup> Note that a pregnancy on the ice results in immediate evacuation (Stand 1994), and also note that while Heywood stresses that in his opinion, the male team member should also be evacuated for reasons of non-discrimination and fairness, this apparently does not seem to be the case (Heywood 1994:95f), effectively forcing the woman to take the professional and social brunt of what is a two-people incident alone.

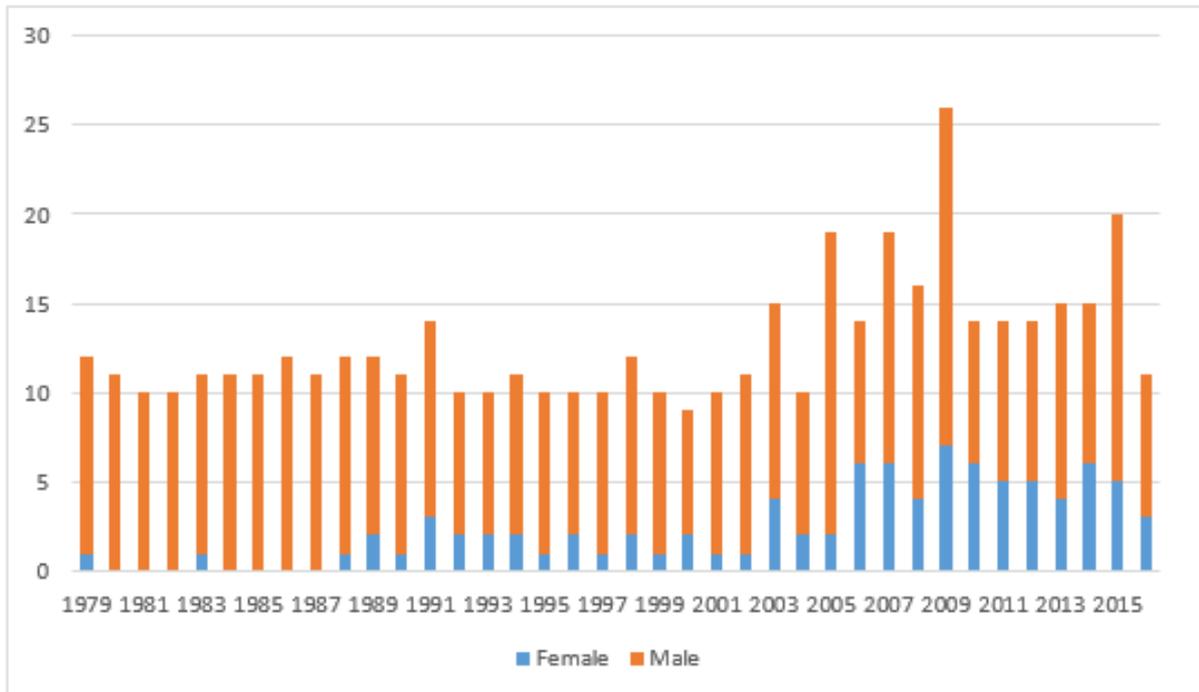
Looking back at the first winterer in which women were allowed to work on the ice as part of the BAS, the then-station commander remembers that in contrast to the negative expectations formed by onlookers, the season went relatively smoothly. While he noticed a “sense of challenge around, [with] people (...) almost looking for things to go wrong”, problems encountered during the season were unrelated to the newly established mixed-gender team:

“[T]his had nothing to do with the fact that we had women in the team, [instead] we had a few personality clashes. The two women [who were deployed together] didn’t get on particularly well with each other, and neither did some of the men amongst themselves. It was people not getting on with each other very well, and while it was easy to attribute that to the social change, it wasn’t due to that. “

The past director of the US Division of Polar Programs, Ed Todd, is quoted as having concluded that women’s presence in the Antarctic bases improved general staff morale (in Raney 1994:46). Among the advantages of having women work alongside men, Law (1994:72, also see Williams 1994:88f) lists “their softening effect upon the cruder male behaviour, the social ambience that is more akin to ordinary everyday society elsewhere and the removal of some of the deprivations” of Antarctic social life. Women, after all “are just people”, as a male British scientist concluded, and are finally no longer seen or displayed as problems but rather, necessary assets to the Antarctic community.

#### 4. Fitting in? Group dynamics and women’s experiences

In varying numbers across different national Antarctic programmes, women are part of station life today, working during Antarctic summers and, albeit in much smaller numbers, wintering on the ice as well (see for example the female-male ratio in New Zealand’s Scott Base since the first season in which a woman wintered, Figure 3).



**Figure 3:** Gender ratio in wintering teams at Scott Base from 1975-2016

How do women experience being outnumbered on the ice? In the confined, isolated, small-group environment of Antarctic station life in winter, a person’s social compatibility is deemed essential for the station’s overall effectiveness and safety (Peri et al. 2000:253). Is this an un-gendered concept, or does gender influence and dictate social compatibility?

#### *Work performance*

Unsurprisingly, in the beginning of women’s official engagement on the ice, gender was perceived to play a significant role for the social fit. The first women who worked as scientists in Antarctica reported the impression that they were observed closely and had to perform impeccably to avoid being labelled negatively because of their gender. Janet Thomson, BAS’s first female scientist to undertake research in Antarctica, commented that she wanted to avoid judgement by male employees. She was vigilant of not doing “anything stupid”, and felt like she had to suppress her gender and “just be one the chaps”:

“I was very aware I was running a gauntlet and that if I did anything silly it would be, ‘Oh, well, that’s what you expect of a woman.’”(Jones 2012)

This experience corresponds with Legler (2011:212), who suggests that in the “testing phase” of women’s engagement in formerly male territory, women were very conscious of being women, attempting to adapt by either becoming “one of the guys” or invisible (Legler 2011:212). Similarly, a female Antarctic pioneer felt that in the 1980s, “it is still true that for a woman to be respected in a given job, she has to do it better than a man” (Land 1981:54).

On the other hand, there were opposing perceptions as well. Two of my female interview partners noted no such experience. An American scientist stated that the only person she felt she had to prove her worth to was herself. She believes that performance was a genuine focus, whereas gender was not:

“Anybody who is new needs to show they know how to do what they have to do, which is not an Antarctica-specific or gender-specific problem.”

A European scientist who was the only woman in an Antarctic drilling team in 1992 stated a similar thought. With an inexperienced team leader and difficult beginnings in the work set-up, the gender question faded into the background:

“We had to work so hard, nobody noticed that I was a woman. (...) I could tell the difference when I was back on the ship and wearing my normal jeans and [everyday clothes] – they looked at me differently. (...) In the beginning nothing worked, so everybody had to be ready to do something, so nobody got any sleep and it was just awful. (...) But we worked very hard physically, and the conditions weren’t so good, so nobody noticed that I was a woman.”

In the late 1990s, a decade later, the attitude seemed to have changed: “The difference was that you could just be yourself, not this feeling of watching your step all the time” (Crossley 1999). However, there may be exceptions to this: Liz Morris from the BAS noted that “there’s still a perception in the community that somehow Antarctica is a thing for chaps, that it isn’t entirely equal, and if you don’t take care, then you reinforce the perception that people have” (Aston 2005).

### *Negotiating relationships*

How did women deal with the sexual tensions, if they occurred or were noticed? A female support worker who was a contractor to the US military noted that unwanted attention from

male military staff was common and became a nuisance to many of her female colleagues after a while. Speaking of two colleagues in their early twenties, she suggested that

“they enjoyed [the male attention] to start with but then as time went on you get sick of it. At first, they were kind of looked at as flirty and enjoying it, but as novelty wore off, they got grumpy and rude. (...) They were young and they hadn’t thought about it.”

Her own strategy for dealing with being a minority, both in gender and nationality (she was a New Zealander working among US-Americans) was to protect herself from unwanted sexual attention by forming a relationship with another employee on the ice:

“I found that the best thing to do actually was to have a partner, and then it takes away all the crap – other people bothering you, particularly military. (...) After I got there, I thought: you know, the easiest thing to do was to have a partner, so that’s what I did. It worked well, really well.”

Having struggled with the authoritarian, entitled attitude of military personnel, she selected a partner who was a civilian. The relationship ended amicably when the season was over. In her second summer working in Antarctica, she had already acquired a reputation that protected her from further harassment:

“I guess that second summer, everyone knew me, everyone knew that I wouldn’t put up with any crap, so I didn’t have that same need to have a relationship with anybody in the winter or the summer. (...) they didn’t bother me – I think the word might have been out [laughs].”

#### *Trades vs science: different experiences?*

With fewer women employed in trades positions in Antarctica, it was my interview partners’ unanimous perception that Antarctica, in terms of gender and employment, is a reflection of the wider national society. In 1994, AntaNZ had not employed a single female tradesperson yet, which the then-Director of the NZ Antarctic Division related back to the general shortage of female tradespeople in New Zealand (Heywood 1994:94). Barry Heywood from the BAS reports the same for female plumbers (1994:95). A male scientist suggested that

“if you had the base made up of hairdresser, cook, nurse – wherever the application pool is much more dominated by females, then we would have more females [in Antarctica].”

Interestingly, among my female interview partners there seemed to be the perception that experiencing problems because of one’s gender was also tied to being in the trades. A

European scientist suggested that women who were employed in engineering or technical teams struggled more because they were outnumbered by males and had to work in a competitive atmosphere:

“Women engineers’ expectations were more negative and they were met. [It’s possible that] men might have looked down on them thinking they were better than the women. Female scientists didn’t have negative expectations and were treated equally. The scientists thought, ‘We’re normal people, why should we be treated differently?’, whereas the engineers had negative expectations.”

Similarly, an American scientist put her “gender-neutral” experience down to her expectations. These expectations had been shaped by her liberal upbringing, in which her father taught her that gender does not matter for professional performance. They were also influenced by her degree in natural sciences that she completed in the 1980s, a period in which very few female students studied engineering-rich subjects. She believes that not expecting to be treated any differently because of her gender resulted in her positive experience.

My project did not have enough time resources and support staff to interview in order to explore this topic further. However, a clear message that was transmitted through the interviews and that I found reflected in the literature is that there is still an imbalance of women working in a trades position in Antarctica, and that their experiences in terms of gender might be different from that of scientists. While I accept that a gender imbalance in Antarctic trades positions is a reflection of the conditions found in the wider society, I am inclined to agree with Crossley (1999:124) who makes the point that “Antarctic culture not only should but actually can lead the general social culture”.

## 5. Getting on with it - Is the gender lens outdated?

Science remains, to date, an overwhelmingly male domain (Dodds 2009:508). In 2009, less than a quarter of all positions in the traditionally male-dominated fields of Science, Technology, Engineering, and Mathematics (STEM) in the U.S. were occupied by women (U.S. Department of Commerce 2011). Antarctica New Zealand has to date not received an application from a woman for some technical positions at Scott Base (J. Patterson, pers. communication, 16 January 2017).

However, there are noteworthy changes taking place in the Antarctic context, with the US National Science Foundation promoting and supporting female scientists in entering or advancing in STEM (NSF, undated), and the Australian *Homeward Bound* project, an all-women science programme that combined scientific training, strategy and leadership instruction, and was initiated in 2016 (Homeward Bound, 2017). Australia has developed the Women in Science Equity Network (Wisenet) to increase female participation and impact in science.

But not everybody agrees that women should be singled out. In an interview that addressed the media frenzy around her person, Dr Ahn, the first woman to lead a Korean station, said:

“Personally, I preferred to be recognized as a good scientist rather than as a brave and pioneering Antarctic station leader. But I should admit that whether I like it or not, I would have to play a role model for young female scientists in Korea and probably other countries too.” (Havermann 2015:12)

Similarly, Lynn Williams, who has worked with ANARE, says that already in the mid-1980s, it was clear that women were accepted in Antarctic teams. In the course of her deployment, she came to think of herself as “just an expeditioner, not with gender attached” (1994:84).

Rejecting the scrutiny around gender and having moved beyond the gender focus was a theme that appeared in most of my interviews as well. A female scientist noted that during her time in Antarctica, the biggest concern for her and the other station inhabitants was not gender, but performance. During her first winter, everyone was aware of the importance of the individual’s ability to do their job, as this would be crucial for the station’s functioning and the group’s wellbeing. Regardless of position, “no-one really cared whether it was a man or a woman, to be honest. (...) Our expectations were more along the lines of task ability rather than how we were going to be treated because of our gender.” Similarly, a US-American female scientist opines that from the 1980s on “it doesn’t make much difference whether a scientist is a man or woman – it’s the science that counts” (Land 1981:102).

This view aligns with what Legler (2011:209ff) calls the “post-masculinist” stage of women’s engagement in Antarctica. Legler defines the post-masculinist phase as one in which people are primarily focusing on their connection with the Antarctic ecosystem and feeling at home, uncontested, in Antarctica. This phase is characterised by an absence of gender and

political notions, maintaining a non-dualistic (man/woman) and non-hierarchical stance. In Legler's view, the history of women in Antarctica can then be understood as having undergone an evolution: In the first phase, women assumed a passive position as transitory and invisible. Next, they actively fought for the right to be actively present in Antarctica (i.e. fighting to be an "Antarctic citizen"), trying to carve out a space for women in male territory. Finally today, so Legler suggests, women have arrived: their status is not questioned by themselves or anybody else – they have become Antarctic citizens. Consequently, Legler found, the focus in women's narratives is now no longer on gender. Challenging the idea of a male-female dichotomy when it comes to human engagement on and with the ice and unmaking the notion of the male hero who controls the Antarctic environment: Has the gendered past been left behind?

This notion is supported by the impressions brought forward by both a female American and a male British scientist I interviewed. Both prioritize the scrutiny of human activities and achievements in Antarctica from an ungendered perspective. The female scientist emphasised that

"Antarctica is an extreme environment to *humans*, it's not extreme just to men or just to women."

She believed that attributing the atmosphere of a station to gender questions is incorrect:

"We're trying to make the Antarctic this special place that is a special environment – that's something we're creating ourselves. There's certainly different challenges in the Antarctic between men and women, just as there are in the real world, just like there would be in space."

In some of my interviews, I noticed a general sense of reluctance or resistance to my questions (see Annex 1 for a list of the structured interview questions employed<sup>15</sup>). For example, when at the end of my interview I asked a male scientist if he wanted to add anything to the topic of gender, he said that

"really, I think it is a non-issue. I wish it would go away. (...) I know SCAR<sup>16</sup> made a big thing about it, and I wish they hadn't done it – why? Why are we still going there?"

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<sup>15</sup> I did not follow this guideline strictly, but rather allowed replies to evoke new or differently-phrased questions. It would therefore be more accurate to call the interviews semi-structured.

<sup>16</sup> He is referring to the WikiBomb event (see [www.scar.org/women/wikibomb](http://www.scar.org/women/wikibomb)), initiated at the 2016 SCAR Open Science Conference in Kuala Lumpur, Malaysia. This was "a celebration of female Antarctic researchers [with] plans to raise their profile to help provide more visible female role models for early career scientists."

Let's get over it! Let's get on with it. Can't we just move forward together, as a people? Why are we still harping on about it?"

He acknowledged that there were still differences in regards to gender in Antarctica, but as he did not believe there was still discrimination, he thought it obsolete to look at human engagement from the gender angle. Similarly, Michelle Raney describes how already in 1979/1980 the NSF's Division of Polar Programs ceased to report on singled-out women's activities in the bases as they considered women's presence in Antarctica "no longer an issue" (1994:46).

Is gender outdated when it comes to questions of selection? The BAS, an NAP that only in the late 1980s allowed women onto the ice and in 1994 still defended this position, emphasises that "personnel are selected on qualifications, and questions of gender are not considered" (Dalmau 1994:20). Indeed, Dalmau suggests that more women get selected for scientific positions than men (1994:27). However, selection of Antarctic personnel is still today predominantly conducted by men. A female scientist interviewed for this project suggested that "there is the possibility that women still get turned away from Antarctica" because of this set-up, as the existing Antarctic culture remains more populated by men than women. While my interview partner emphasised that she believed this culture is changing, she also noted it possible that even though applicants may be equal, it may still be the man who gets appointed in some cases due to this prevailing notion. On the other hand, a male scientist I spoke to believed that nothing needed to change, that gender equality was achieved: There are no barriers to women working in Antarctica; people just have to be able and prepared to deal with Antarctica's challenges on an emotional, mental, and physical level. In his perception, there is no discrimination against women, but rather that "the best person for the job" is selected.

But beyond selection and training background, there may be gender-related issues to consider when it comes to work in Antarctica. Women "tend to operate more inclusively, more through relationships, more flexibly", whereas men "tend to be far more exclusive in their dynamics, more competitive, less considerate and more political" (Dalmau 1994:33). Often run by men from STEM backgrounds, Dalmau believes that women's tendencies to work are steamrolled in day-to-day procedures and dynamics, "at great personal costs to

[women's] own identity as women" (1994:33). He also thinks that "a gender-blind culture in Antarctic communities may be many years away still" (1994:36).

Is the challenge in regards to gender on ice on the outside of the Antarctic community rather than on the inside? An American female scientist suggested that rather than researching gender issues among the deployed teams, a bigger challenge would be to

"get those NAPs that don't allow women to winter to recognise that women have the ability to have that experience too. "

A male New Zealand support worker agrees with the view that barriers to the equal treatment of women working in Antarctica exist more in the home society than on the ice itself. He notes that double standards are applied when it comes to the perception of Antarctic deployment, which he experienced first-hand:

"It was interesting – every time I went to the ice, and people found out I was going for six or seven months, the first question was (...), they would say to [my wife, also an Antarctic scientist], 'What are *you* going to do?', and she'd be like, 'What do you mean, what am I going to do? I'm going to live my life, like I always have!' [laughs] (...) But when [my wife] goes away, no-one asks me, 'What are you going to do? You're gonna be alright?' [laughs] It's just bizarre eh?"

But what does "work on the ice" constitute? To ensure a more realistic perspective, this concept needs to be widened to include the Antarctic work environment "off-ice" as well. A female European scientist suggested that while she did not perceive discrimination on the ice or selection onto the ice (in fact, as a student first going to the ice, she was chosen over male competitors), she remarked that at her university department, there are no female permanent staff members.

Take, for example, executive positions for the Council of Managers for National Antarctic Programs (COMNAP). In 29 years, from 1988 to 2017, 160 positions (Chair, Chair Elect, Managers of National Antarctic Programs Representative (x3), Standing Committee for Antarctic Logistics and Operations Chair, Executive Secretary) were available. Out of these, 21 positions were held by a total of four women.<sup>17</sup>

A male British scientist agreed that in terms of practical work, he does not perceive there to be discrimination: "Perhaps in some way, we've achieved it in Antarctica – jobs, research posts, some board positions; we have both males and females." Imbalance in trades positions

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<sup>17</sup> Record of COMNAP meetings and officers, courtesy of Michelle Rogan-Finnemore.

is not an Antarctic, but a societal problem, but in his opinion, gender issues will remain important as long as there is income disparity and glass ceilings for women in wider society.

## 6. Conclusion and further research

### *A worthwhile topic? Concluding remarks*

Women on the ice have come a long way in the last 120 years. In my interviews, women talked about feeling like they belonged in Antarctica but had to first overcome exterior obstacles and reservations from NAPs and society in order to claim their places in the international Antarctic community.

Many NAPs have come a long way as well, employing women in both science and trade based positions based on merit, not gender. This has become possible as perceptions about women's general suitability for the Antarctic environment have changed significantly since the start of the 20<sup>th</sup> century. With better gear, more social awareness, more assertiveness, and increasing numbers of women proving their physical and professional ability on the ice and against the elements, the olden-days arguments of keeping the physically "weaker sex" out of Antarctica have lost traction. Many NAPs have remedied the lack of facilities that fuelled another argument against women's presence in Antarctica. The last male frontier (Griffiths & Green 2011:360) has now been thoroughly "invaded" (Chipman 1986:84), "incursed" (Griffiths 2007:215), and, finally, de-constructed.

Relationships between the genders in Antarctica and their possible social impacts have always been the most discussed and contested issue in regards to women working and living on the ice. Over the last decades, perceptions among the general public and the NAPs have changed from regarding mixed-gender teams as disruptive, inconvenient, and problematic, to acknowledging them as normal, necessary, and beneficial.

Some participants in this research project expressed doubt over whether gender in Antarctica is still a valid lens through which to explore human engagement on the ice, promoting instead a performance-centred and "gender-blind" perspective. My research project has attempted to show that in terms of gender discrimination, it is clear that in the wider human society, gender equality remains out of reach. As Antarctica is far from being a perfect society, wider-society challenges will commonly be reflected on the ice as well. I

therefore argue that gender issues remain a worthwhile topic to research in the Antarctic context, and close this research project with some suggestions for further research on women in Antarctica.

### *Further research*

This research project yielded perspectives and experiences on gender in Antarctica. Its limitations are in regards to the small number of participants and the limited breadth of ethnicities involved: my research participants were European (3), US-American (1), and New Zealanders (2). More research is needed using a wider sample of ethnic backgrounds so as to ensure a more representative sample of men and women engaged in Antarctica today.

Further research is also needed in regards to gender and location. Antarctica as a work environment has become less extreme than in the pioneering days. The degree to which Antarctic workers were isolated during their employment on the ice has changed dramatically: the internet, regular flights (increasingly also over winter) and better communication with the outside world mean that the perceived distance to home has decreased. Having more means of contact with the outside world (a step up from short-wave radios and satellite telephones) makes people less emotionally and socially vulnerable. This influences relationships between people, as a female scientist remarked: “It makes it easy, one reacts less strongly, gets hurt less easily. It is more relaxed [now] because there are more means of communications with the rest of the world.”

While perceived distance has decreased with better technology, differences between stations remain in terms of their locations. An Antarctic worker will feel less isolated on a research station on the Antarctic Peninsula, which is likely to influence relationships and behaviour: a two-hour flight connects Argentina or Chile to Antarctica, whereas a worker stationed in the South Pole station will experience a far higher degree of exposure and isolation in comparison. Similarly, gender relationships may be perceived differently on an isolated Australian station that a male support worker called “hidden from administration and rules”. The differences between NAPs and how location plays into gender relations deserve a more thorough look.

Additional research would also need to be conducted on the question in what ways class and gender are connected in the Antarctic environment (Dalmau 1994:28), and what role culture plays in this. Based on her own experiences in the early 1990s, Pene Greet (in Edwards

and Graham 1994:107) felt that the Australian station's culture worsened in its treatment of women when a higher number of construction workers were present. Her personal experiences led her to believe that the more normal the gender ratio, the better the social and work-related atmosphere would be. More in-depth research is required to determine if and how this has changed in the nearly thirty years since her observations.

## 7. References

Anonymous (2016). *An Antarctic Time Line: 1519-1959*. (Online) Retrieved from: <http://www.south-pole.com/p0000052.htm> (Last accessed 16 January 2017).

Aston, F. (2005). Women of the White Continent. *Geographical* 77(9).

Atlis, M., Leon, G., Sandal, G., & Infante, M. (2004). Decision processes and interactions during a two-woman traverse of Antarctica. *Environment and Behavior* 36(3), 402-423.

British Antarctic Survey (BAS). (2015). "Halley VI Research station." (Online) Retrieved from: <https://www.bas.ac.uk/polar-operations/sites-and-facilities/facility/halley/> (last accessed 7 February 2017).

Chipman, E. (1986). *Women on the ice. A history of women in the Far South*. Melbourne University Press. 224p.

Crossley, L. (1999). Icy adventures under the Aurora Australis: Women and leadership in Antarctica. *International Review of Women and Leadership* 5(1).

Dalmau, T. (1994) "International approaches: reflections on managing women and men in Antarctic expeditions." In: Edwards, K. and Graham, R. (eds.) *Gender on ice: Proceeding of a conference on women in Antarctica held in Hobart, Tasmania, under auspices of the Australian Antarctic Foundation*. Australian Government Publishing Service. 13-38.

Darlington, J. (1957). *My Antarctic Honeymoon. A year at the bottom of the world*. London: Fredrick Muller. 256p.

Dodds, K. (2009). Settling and unsettling Antarctica. *Signs* 34(3), 505-509.

Dodds, K. (2012). "The Antarctic: A very short introduction." Oxford University Press. 160p.

Edwards, K. and Graham, R. (eds.). (1994). *Gender on ice: Proceeding of a conference on women in Antarctica held in Hobart, Tasmania, under auspices of the Australian Antarctic Foundation*. Australian Government Publishing Service. 129p.

Greet, P. (1994). "The rewards and difficulties of station life: case studies." In: Edwards, K. and Graham, R. (eds.) *Gender on ice: Proceeding of a conference on women in Antarctica held in Hobart, Tasmania, under auspices of the Australian Antarctic Foundation*. Australian Government Publishing Service. 103-109.

Griffiths, T. (2007). *Slicing the silence. Voyaging to Antarctica*. Harvard University Press. 407p.

Griffiths, T. & Green, G. (2011). "Culture." In: Haward, M. & Griffiths, T. *Australia and the Antarctic Treaty System. 50 years of influence*. University of New South Wales Press. 346-372.

Havermans, C. (2015). Polar interview. *Women in Polar Science*. 8-13.

Heywood, B. (1994). "Management Issues." In: Edwards, K. and Graham, R. (eds) *Gender on ice: Proceeding of a conference on women in Antarctica held in Hobart, Tasmania, under auspices of the Australian Antarctic Foundation*. Australian Government Publishing Service. 93-101.

Homeward Bound (2017). *About*. (Online) Retrieved from: <https://homewardboundprojects.com.au/about/> (Last accessed 26 January 2017).

Jones, B. (2012). 'Women won't like working in Antarctica as there are no shops and hairdressers'. (Online) Retrieved from: <http://www.telegraph.co.uk/news/earth/environment/9260864/Women-wont-like-working-in-Antarctica-as-there-are-no-shops-and-hairdressers.html>

Land, B. (1981). *The new explorers. Women in Antarctica*. Dodd, Mead & Company, New York. 224p.

Law, P. (1994). "The all male expeditions 1947-66." In: Edwards, K. and Graham, R. (eds) *Gender on ice: Proceeding of a conference on women in Antarctica held in Hobart, Tasmania, under auspices of the Australian Antarctic Foundation*. Australian Government Publishing Service. 67-73.

Legler, G. (2011). The end of the heroic illusion: how three generations of women writers have changed the literature of Antarctica. *The Polar Journal* 1(2), 207-224.

National Science Foundation (undated). *ADVANCE: Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers (ADVANCE)*. (Online) Retrieved from: [https://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5383&org=SBE&sel\\_org=SBE&from=fund](https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5383&org=SBE&sel_org=SBE&from=fund) (last accessed 26 January 2017).

NZ Ministry for Culture and Heritage (2014). "First among men." (Online) Retrieved from: <https://nzhistory.govt.nz/politics/antarctica-and-nz/people> (Last accessed 25 January 2017).

Palinkas, L. (2002). On the ice: Individual and group adaptation in Antarctica. Online Article. Retrieved from [http://www.bec.ucla.edu/papers/Palinkas\\_On\\_The\\_Ice.pdf](http://www.bec.ucla.edu/papers/Palinkas_On_The_Ice.pdf)

Puskeppelit, M. (1994). The all-female expedition: a personal perspective. In: Edwards, K. and Graham, R. (eds.) *Gender on ice: Proceeding of a conference on women in Antarctica held in Hobart, Tasmania, under auspices of the Australian Antarctic Foundation*. Australian Government Publishing Service. 75-81.

Raney, M. (1994). "Woman in a man's world: A personal and management perspective." In: Edwards, K. and Graham, R. (eds.) *Gender on ice: Proceeding of a conference on women in Antarctica held in Hobart, Tasmania, under auspices of the Australian Antarctic Foundation*. Australian Government Publishing Service. 39-47.

Sarris, A. & Kirby, N. (2005). Antarctica: A study of person-culture fit. *Australian Journal of Psychology* 57(3), 161-169.

Schmidt, L., Wood, J., & Lugg, D. (2005). Gender differences in leader and follower perceptions of social support in Antarctica. *Acta Astronautica* 56, 923-931.

Tilbury, G. (1994). "Management issues." In: Edwards, K. and Graham, R. (eds.) *Gender on ice: Proceeding of a conference on women in Antarctica held in Hobart, Tasmania, under auspices of the Australian Antarctic Foundation*. Australian Government Publishing Service. 93-102.

U.S. Department of Commerce (2011). *Women in STEM: A Gender Gap to Innovation August 2011. Executive Summary*. (Online) Retrieved from: <http://files.eric.ed.gov/fulltext/ED523766.pdf> (Last accessed 26 January 2017).

Williams, L. (1994). Observations on mixed groups in Antarctica. In: Edwards, K. and Graham, R. (eds.) *Gender on ice: Proceeding of a conference on women in Antarctica held in Hobart, Tasmania, under auspices of the Australian Antarctic Foundation*. Australian Government Publishing Service. 83-91.

## 8. Annex

### 8.1 Number of women in winter teams at Scott Base, 1957-2016

Year	Team members total	Number of women	Positions held by women
1957	23	0	
1958	11	0	
1959	10	0	
1960	13	0	
1961	13	0	
1962	12	0	
1963	14	0	
1964	13	0	
1965	14	0	
1966	12	0	
1967	12	0	
1968	11	0	
1969	11	0	
1970	12	0	
1971	12	0	
1972	11	0	
1973	11	0	
1974	11	0	
1975	11	0	
1976	11	0	
1977	10	0	
1978	11	0	
1979	12	1	Scientific Officer
1980	11	0	
1981	10	0	
1982	10	0	
1983	11	1	Meteorologist
1984	11	0	
1985	11	0	
1986	12	0	
1987	11	0	
1988	12	1	General duties
1989	12	2	Comms. supervisor General duties
1990	11	1	Chef
1991	14	3	General duties Telecom operator Chef
1992	10	2	General duties Telecom supervisor
1993	10	2	Chef Domestic
1994	11	2	General domestic Base support officer/science technician
1995	10	1	General Domestic
1996	10	2	No titles
1997	10	1	Domestic
1998	12	2	Domestic Chef
1999	10	1?	General Domestic
2000	9	2	Science technician Domestic
2001	10	1	Domestic
2002	11	1	First Aider+Domestic
2003	15	4	Chef Science technician First Aid+Domestic Scientist K085

2004	10	2	Chef Domestic+First Aider
2005	19	2	Domestic+First Aid Domestic+Canteen manager
2006	14	6	Chef Base Manager AHT Conservator Trade assistant Field support coordinator
2007	19	6	AHT conservator x3 Domestic Domestic/First Aider Chef
2008	16	4	Conservator x4
2009	26	7	Senior conservator Conservator x3 Domestic/First Aid Science technician Deputy leader/domestic
2010	14	6	Lead AHT conservator Conservator x3 Domestic Chef
2011	14	5	Conservator x3 Medic/domestic Science technician
2012	14	5	Conservator x2 Lead conservator Medic/domestic Chef
2013	15	4	Conservator x2 Lead conservator Winter leader/domestic
2014	15	6	Medic/domestic Culinary engineer Conservator x 3 Lead conservator
2015	20	5	Science technician support Winter leader/domestic Field support Chef HFC painter (June-July)
2016	11	3	Science technician support Field support Domestic/medic
2017	?	2	Domestic/medic; field support

## 8.2 Supervised project: Interview questions (guideline)

### *Basic Antarctic background*

1. Can you give me a brief overview of your Antarctic engagement?
  - 1.1 When did you first go to Antarctica, and in what position?
  - 1.2 How long did you spend in Antarctica?
  - 1.3 How many times and in what positions have you gone?
  - 1.4 When was the last time you've been to Antarctica?

### *Experience*

2. Can you tell me about your experience in Antarctica?
  - 2.1 In terms of collaboration, was your experience different from your expectations?
  - 2.2 Was there an 'aha' moment for you that changed how you felt about working in Antarctica?
  - 2.3 How did your Antarctic experience change you (in terms of your gendered relationships)?
  - 2.4 What, if anything, did you struggle with?
  - 2.5 What did you learn over time/as you adapted?

### *Opinion*

3. What are the barriers to, or enhancers for, women working in Antarctica?
  - 3.1 Do women experience more, or different, challenges on the Ice than men?
  - 3.2 Antarctica is a place in which traditionally there are more men than women. Did this present in specific ways? If so, can you outline these ways?
  - 3.3 Are you aware of changes having been made and/or being made in this regard?
  - 3.4 What would you say to a woman interested in working in Antarctica, before she goes for the first time?

### *Other*

4. Is there anything else you can think of in regards to this topic that you would like to add?